NEWS IN PERSPECTIVE

AUGUST 15, 1961

ECONOMIC CLIMATE

BROADENING IMPROVEMENT in the state of the economy has made it completely clear that the recession lies in the past. But along with resurgent business activity there is fear of renewed inflation. The Administration's economic advisers--both professionally- and politically-oriented--think there is little real chance for resumption of an inflationary spiral. But they are more than willing to take the field against inflation--particularly since they consider this a straw man for an enemy.

FOCAL POINT for the Administration's jawbone war against rising prices will be the steel industry, where a rise of from $4- to $5-per-ton for many products is strongly indicated for early Fall. This will be based on the idea that a cost hike in a raw material as important as steel puts almost all the nation's industries into an additional cost squeeze. At the same time, less attention will be paid to the impact of certain costs on makers of consumer goods. Chances are that the Administration's attitude will result in holding down--but not stopping --price and wage hikes.

PRODUCTION LEVEL has climbed back to its pre-recession point. Across-the-board gains indicate that all sectors of the economy are sharing the gains. Unemployment--still at a high rate of just under seven percent, seasonally adjusted --is a major problem. The unemployment rate should dip perceptibly when the school year starts; joblessness among adult males is already declining.

THE ECONOMY HAS BOUNCED BACK, experts consulted by the U. S. Chamber of Commerce agree. No "boom" is predicted, but the upsurge should continue--well into 1962, possibly longer.

But, supporting the record showing that the rate of growth of the electric utility field as well as that of the general economy has been "substandard" recently (as noted by Commonwealth Services' Consultant M. J. Kraemer) is the fact that electric utility financing is reported (by Ebasco Services) to be off $75-million in the first six months of '61 compared with the like period of '60. Yet, public utility financing as a whole (including telephone and gas) was up an impressive 77-percent.

MANAGEMENT VIEW

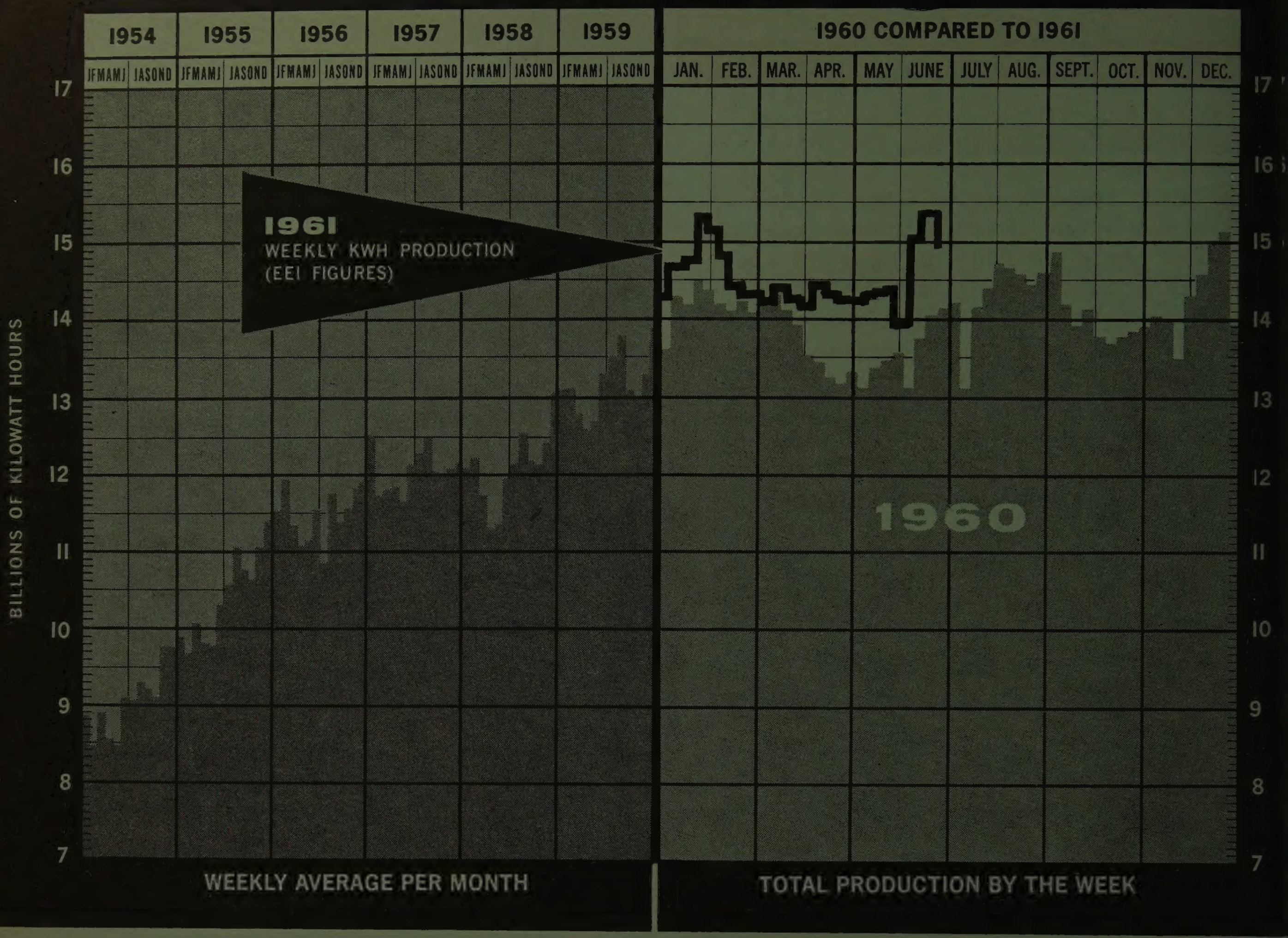
ATTITUDE OF INDIFFERENCE toward a utility company must be kept in mind by employees representing their organizations in public relations roles, a Montana-Dakota Utilities Co. division manager, James Philips, emphasized in recent remarks to operating personnel. Simple, but sound are these other points he made: (1) Don't talk about our problems, (2) Use customer's language, (3) Remember that we get no credit for service he expects, but we do for extra service, (4) Customers have no loyalty to MDU as a company . . . but they have loyalty to you, and that is reflected in their support of the company. (For more views on utility PR, see page 51.)

THE POLICIES WE SET must be in the best interests of the state of Arizona, directors of the Arizona P.S. Co. advised Sen. Frank E. Moss (Utah), after he implied that they would act in collusion with other Rocky Mountain utilities and with Ebasco Services . . . to physically interconnect their systems over government lines. If this is permitted, warned Sen. Moss, "We will have fostered and encouraged a giant monopoly in the west." But, in a "shocked" reaction, the Arizona P.S. Directors described the utility as "an independent and locally managed company," called this "a serious charge against our personal honesty and integrity," asked Sen. Moss to either offer evidence to prove his charges or to retract his statements and apologize.

IMPROVEMENT-CONSCIOUS COMMUNITIES all through the service area of the Appalachian Power Co. in the Virginias owe their new outlook on industrial development to this utility's "Project Decision." The AEP System company is using a $200,000 investment for a continuing pro-

Electric Utility Barometer

(Source: Edison Electric Institute)



NEWS IN PERSPECTIVE

gram of help to 35 communities, selecting them in the order of "best possibility" for a new industry location. After erecting a shell building and helping to attract a suitable industrial occupant, the utility gets back its $200,000 investment and starts the process in Community No. 2. By bringing to a community its "profile," Appalachian believes, the utility can help a town to strengthen its weak spots, improve its appearance and facilities, become more competitive in the new industry market.

CONSTANT DRIP-DRIP OF CARTOONS--This "logical route" to attract newspaper readers has been used by the Montana Power Co. since the first of the year (1) to compare the free enterprise system with other forms of government, (2) to explain business terms, (3) to show the dangers of large government and government encroachment upon business, and (4) to show that what hurts business hurts the employee, the customer and the community. Pulitzer prize-winning cartoonist Reg Manning has drawn the series of editorial style cartoons inserted in advertising space (and already in demand by other utilities).

"TVA's NEW LOW RATE will provide a further incentive to the widest possible use of electricity as envisioned by Sen. Norris . . ." the TVA Board said. But spokesmen for investor-owned utility companies issued statements minimizing the significance of the TVA action--For example: the Southern Company's Pres. Harllee Branch, Jr. said: "The new rate appears to be merely another optional rate. . . . It is ridiculous to say that the new rate will serve as a 'yardstick' for measuring the reasonableness of rates paid by customers in other areas." And Atlantic City Electric Co. Pres. James P. Hayward saw the "tax-avoiding" agency's move as part of an increasingly successful effort to secure industries, in unfair and direct economic competition with many of our states.

BOUNDARY PROJECT "GREEN LIGHT" given to Seattle City Light by the FPC last month ended a 7-year struggle "favorably" for the big municipal utility. Commented Supt. Paul J. Raver: "The next step is to proceed with the construction and make available as soon as possible this much-needed low-cost power for Seattle and the Pacific Northwest." (In Oregon, Pacific P.&L. Co.'s Chairman Paul B. McKee observed that waterpower will be insufficient to meet growing energy requirements of the Pacific Northwest after the current decade . . . and new generating units in the early '70s "may have to be entirely thermal.")

PG&E STORED WATER, conserved last winter in the California utility's 59 Sierra Nevada hydroelectric reservoirs, has been released to increase stream flows in many rivers during the dry summer. PG&E's Pres. Norman R. Sutherland told a recent governor's dry-year water conference how the company had held back the water rather than using it for generating electricity, buying more fuel oil and gas for its steam plants instead.

WASHINGTON INFLUENCE

BIDDING . . . AND ANTI-TRUST--Hot summer days in the capitol seemed not to retard action on this supercharged scene, as these developments occurred: (1) Interior Sec'y Udall has noted "a gratifying decline" in identical bids for power gear and line hardware for Interior Dept. projects; (2) meanwhile, this reporting procedure has been set up: when invitations to bid worth more than $10,000 yield identical offers, facts are to be given to the Attorney General within 20 days; (3) and, the Justice Dept.'s decision to allow a waiting period of at least 30 days before consent judgments are final suggests that stiffer consent decrees for settling anti-trust cases may be in the offing; (4) while, on the Hill, a package of 4 bills intended to deal with problems highlighted by hearings on price fixing and bid rigging in the electrical industry, submitted by Sen. Kefauver and Rep. Celler, provide for tougher penalties . . . and aim directly at preventing executives from "winking" at violations for which they have been penalized by small fines in the past.

NRECA CRIES 'WOLF' once again in a resolution of its board of directors urging the Kennedy Administration to overcome "a multi-million dollar lobbying and propaganda campaign" which--the public power outfit says--the "commercial power utilities and their allies" have launched against development of the nation's natural resources to their full potential. Resolution of NRECA's board was apparently also intended to try to put some heat on the Administration. It made pointed references to Kennedy's campaign speech in Billings, Mont., on natural resources, and urged that the campaign pledges he made there be drafted as specific legislative proposals.

STREET LIGHTING MONEY can be borrowed by small towns under the new Housing Act. Loans, at low rates for 40 years, can be made from a special fund of $500-million available to communities of up to 50,000 population with special priority given to those of less than 10,000. Cities up to 150,000 are eligible to borrow if they are in a depressed area.

WATER RESOURCES PLANNING bill has been sent to Congress by the White House. It provides for federal-state coordinated planning through regional or river basin commissions, and for a federal Water Resources Council. First job proposed for the Council is to set new standards for formulating and evaluating water resources projects.

INDUSTRY SIFTINGS

UTILITY COMPANY MILESTONES--In recent weeks these events were "big" in the corporate lives of electric power companies: Duke Power Co., in its 57th year one of the 10 largest electric operating companies, was traded (under the symbol "DUK") on the N. Y. Stock Exchange for the first time; directors of Commonwealth Edison Co. set up for stockholder voting in Sept. a proposal for a 2-for-1 stock split; all company employees took time out for a streamlined five-minute ceremony on one big day in 1961, 75-years after Atlantic City Elect.'s corporate birth.

NEWS IN PERSPECTIVE

CITY ELECTRIC PROPERTIES in two more communities found buyers last month--In Goshen, Indiana, a $2-million sale gave that city "a single, well-planned integrated electric system," in the words of the purchaser, No. Indiana P.S. Co. In Elkton, Va., the town council voted to sell the municipal distribution system for $500,000, subject to the ok of residents (and to agreement of the purchaser, Virginia Elect. Power Co., VEPCO wanting a 30-year franchise and a 10-year contract covering municipal lighting and services). And, in Springfield, Ore., voters rejected for a second time the financing that would have enabled that city's electric system to acquire the competing system operated by Pacific P.&L. Co.

GAS HEAT TO ELECTRICITY by direct conversion may be accomplished in the 5-watt thermoelectric module under development by General Atomic in a joint program with the AGA. The developers say the generator, when incorporated into gas-burning household devices, would convert part of the heat from the gas flame directly into small amounts of electric power . . . for operating a blower on a gas furnace, or to operate controls, fans, pumps, and lights in other gas appliances.

HELP IN AIR POLLUTION CONTROL may be coming from a new GE-developed device (not yet marketed)--a condensation nuclei detector, which is capable of isolating smallest airborne particles known. (How important is air pollution control to an electric utility company? --One, the Philadelphia Elect. Co. has spent more than $13-million in the past 26 years at its eight steam-electric generating stations for equipment and research to solve this key PR problem.)

INTERNATIONAL ELECTRICAL STANDARDS soon to be published, after approval in the '61 meeting of the International Electrotechnical Commission, include specifications for protective enclosures for low-voltage switchgear and controlgear and for series capacitors for power systems.

RADIATION EXPOSURE RESULTS relative to the adequacy of available workmen's compensation covering injury or disease--this area of increasing concern has been the subject of a study by the Industrial Forum. Says a recently released Forum study report: "It would appear to be premature to enact . . . legislation . . . and further scientific inquiry into the effects of exposures should be encouraged."

GE'S IMAGE: UNDAMAGED?--One sign that long-term leadership wears well, even through corporate difficulties such as General Electric is experiencing in the anti-trust actions, is the standing the company retains among senior high school students. A survey by Scholastic Magazines among 5000 boys and girls shows GE outranks all others as "the company I consider leading . . . in engineering, in scientific research" and first choice "if I were to choose now a large national company to work for." (Close behind in the teen-age opinion: Westinghouse.)

"NEGOTIATIONS ARE ACTIVE" in heavy electrical apparatus . . . pointing to improved business in the electric utility industry, observes Mark W. Cresap, Westinghouse president. He adds: demand for distribution apparatus is expected to follow the normal seasonal pattern of improvement in the last half of the year.

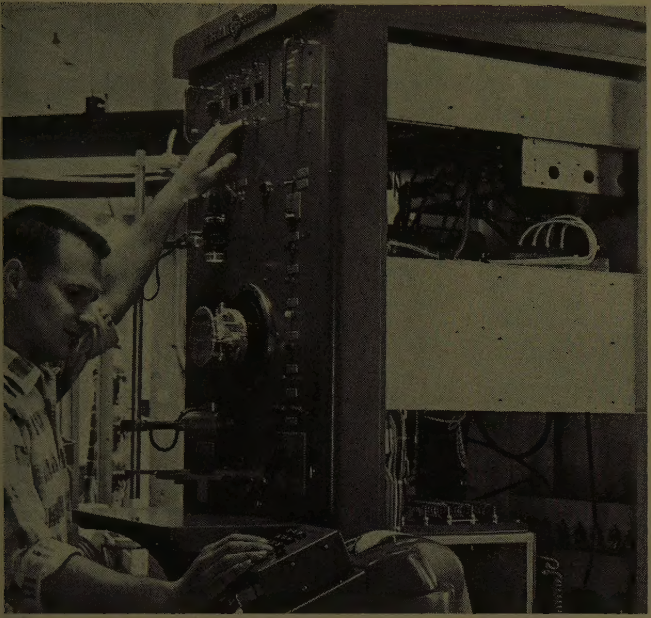
SWEDISH BWR POWERPLANT is being designed by Allis-Chalmers, which had previously designed and installed a high-flux research reactor for that country. The 56-megawatt boiling water reactor would deliver steam at 1250-psig, 574-F directly to the turbine.

"MEET CITIZEN ATOM" FILM being distributed nationwide by General Electric is helping to increase the "inadequate public knowledge concerning nuclear development," disclosed in GE's 1960 survey. The 15-minute film strip, available for $10 a copy, is described in a brochure (GEZ 3530), which can be obtained from GE, Room 210, Bldg. 6, Schenectady 5, N. Y.

CROSS-STATE PROJECT IN N. Y., a 650-mile transmission linkup at 345,000-volts, moves a big step closer this month with the startup of the Clay Electric Station. Central, eastern and western New York facilities are eventually to be interconnected.

ENGINEERING-OPERATIONS

In-Service Meter Tester Checks Meter Calibration



A completely transistorized electronic test unit for automatic testing of single-phase watt-hour meters, recently placed in service by Duke Power Co. checks meter calibration under heavy, inductive and light loads in less than a minute. Test results are shown on a visual readout or in digital form on tape. The unit is said to be capable of testing all manufacturers' two-wire and three-wire single-phase meters of "A" and "S" connected type, with accuracy of plus or minus one-tenth of one percent. The unit was designed and assembled by G-E's Meter Department.

Construction Begun On Sea Water Conversion Plant

The Westinghouse Electric Corp. has begun construction of a one-million-gal per day plant that will convert sea water to fresh water at Point Loma near San Diego, Calif. The project, which is jointly sponsored by the U. S. Department of Interior's Office of Saline Water and the State of California Department of Water Resources, calls for construction to be completed during November, 1961.

The flash-evaporation process used in this plant will consist essentially of spraying heated sea water under pressure into a chamber that is at a lower pressure and temperature. A portion of the water "flashes" into vapor and is then condensed, providing water that is nearly free of impurities. The remaining salty water passes through a series of additional chambers where the flashing process is repeated. At each additional stage the condensed, salt-free water is piped off.

The architect-engineering services were handled by the Fluor Corp. Ltd., of Los Angeles. The Ralph M. Parsons Company of Los Angeles is participating in the engineering and construction of the plant.

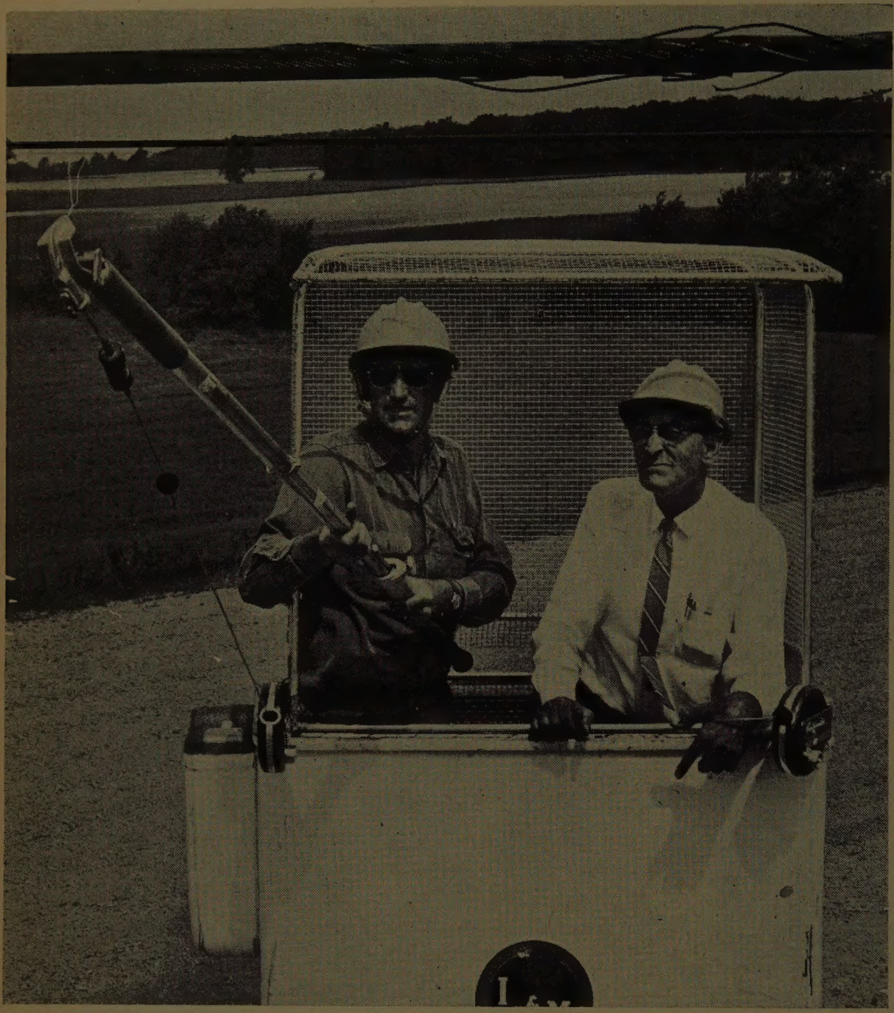
Octagonal-Aluminum Poles, Compressed Aluminum Conductor Used For 115-KV Line

June 7th, Louisiana Power & Light Co. placed in service a new, unique 115-kv transmission line, constructed for most of its 3¼-miles along General De Gaulle Drive, New Orleans. Features of the line are 85-ft high aluminum structures, sky-blue insulators, and graceful, upswept arms.

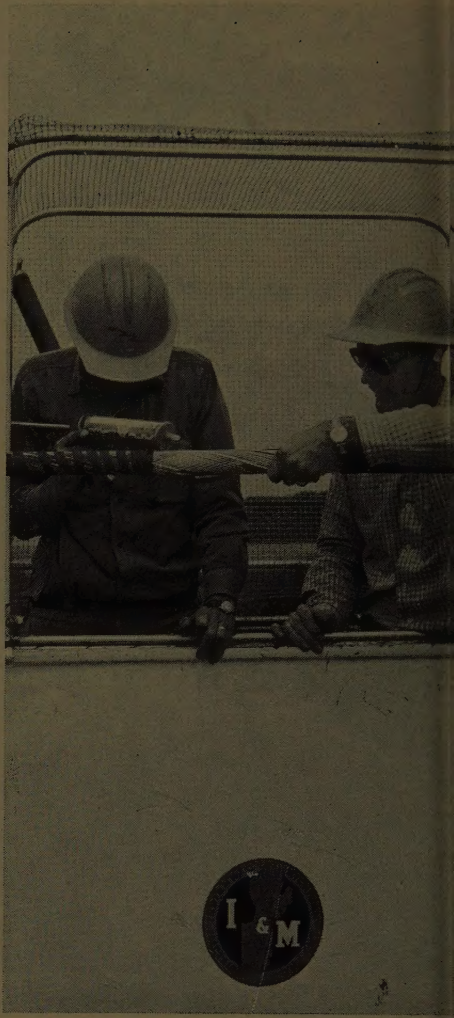
Each ornamental, octagonal structure is supported by a 54-in. pre-stressed concrete piling 20 ft in length. The structures are designed to withstand winds of hurricane velocity with ample safety, according to LP&L Co.

The aluminum conductor used in constructing the line is 1,468 MCM 36/1 ACSR, and was compressed during its manufacture to eliminate air spaces between strands.

Louisiana Power & Light Company's new 115-kv transmission line which was constructed on the West Bank area of New Orleans and in the nearby community of Gretna. The line, which features ornamental octagonal poles and a new-type, compressed-aluminum conductor, was constructed through a rapidly growing residential and commercial area.



Connecting bucket lined with metal mesh to the 345-kv live line with clamps so that the bucket, linemen and conductor are at the same potential.



After taping the loose strands together on both sides of the spot where the repair sleeve will be placed, the inhibitor is applied.

CONDUCTOR REPAIRED ON 345-KV LI

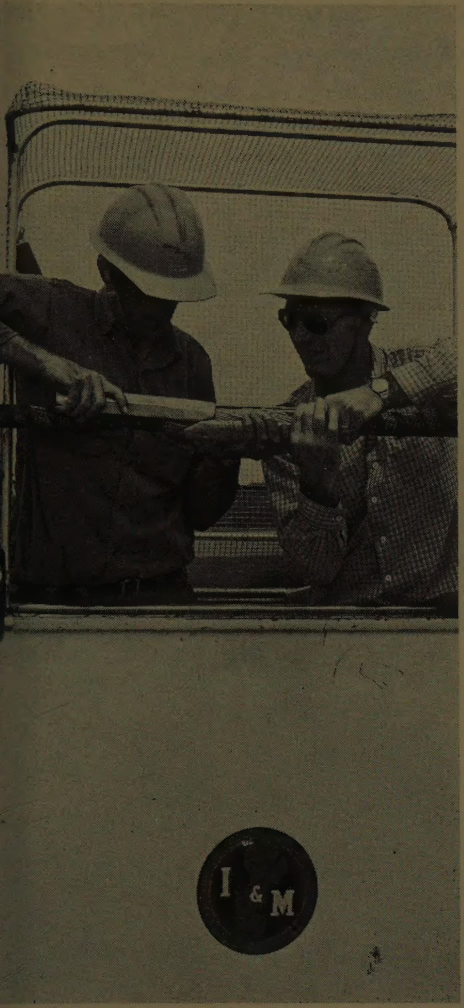
A repair sleeve was installed on a 345-kv live line in one hour—would have taken 25 man-hours prior to development of the bare-hand technique.

ON JUNE 1, 1961, two linemen of the Indiana & Michigan Electric Company, an operating subsidiary of the American Electric Power System, worked on a 345-kv transmission line with their bare hands—a feat never before accomplished in the electric utility industry.

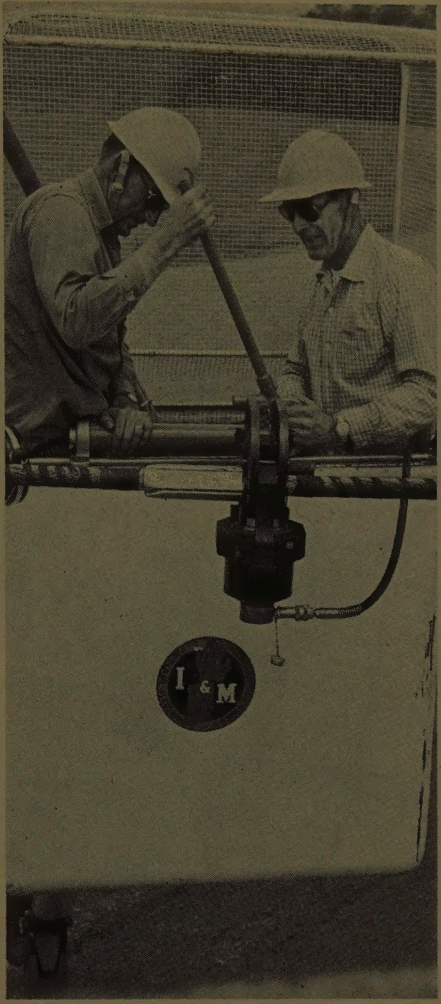
Site of the historic line-repair work was eight miles west of Lafayette, Ind. on the utility's Breed-Olive line. Working under the direction of Harold Rorden, high-voltage practices engineer with AEP, the linemen installed a repair sleeve in an hour while the line remained in service. Prior to development of the bare-hand technique, the line repair job would have taken 25 man-hours and the line would have had to be removed from service.

"No sensation whatsoever," the linemen said on returning to the ground. The linemen are James Lord, a veteran of 14 years of service with I&M; and Edward Sharp, who recently observed his tenth anniversary with the utility.

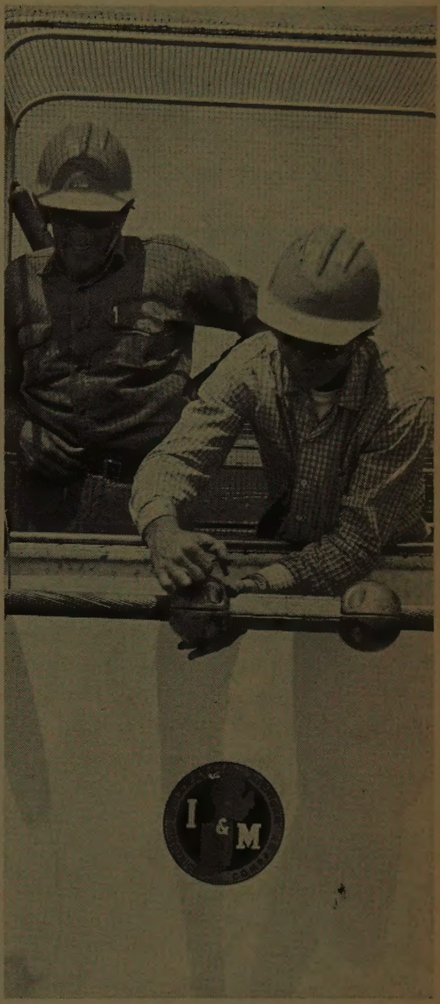
Rorden, who developed the basic idea of working "hot" lines barehanded and has supervised its research and testing, previously had



The repair sleeve is placed in position.



The repair sleeve is compressed in place—same method that would be used on a dead line.



Linemen complete the job by installing the "peanut" clamps after removing tape.

INE WITH BARE HANDS

directed bare-hand repairs of energized 138- and 34.5-kv lines by American Electric Power System linemen. (See H. L. Rorden's Article "LIVE LINE MAINTENANCE WITH BARE HANDS CUTS MAN-HOURS AND HAZARD"—EL&P, Dec. 15, 1960.) The June 1 operation, however, was the first time this technique was used on a 345-kv line.

The I&M linemen accomplished their historic feat while standing in a fiberglas bucket hoisted to the overhead line by a truck-mounted insulated aerial boom. The bucket is lined with a metal mesh that is connected by clamps to the conductor on which the men are working, thus energizing the screen and the linemen at the same voltage as the line.

The cables used to connect the metal mesh and conductor are equipped with automatic reels and release connectors developed by George W. Hays, assistant division supervisor of transmission and distribution for I&M.

The linemen's safety was provided for by the insulated boom which protected them from the difference in voltage between the ground and the live conductor.

D. P. Dumont, I&M's general superintendent of transmission and distribution, said the bare-hand repair work has been adopted throughout the I&M two-state service area. He cited the major benefits of the new method, including further improvements of reliable electric service to customers by ensuring service continuity through elimination of interruptions for line repairs, reduced line maintenance costs, simplified working conditions, and greater safety in many cases than with the use of live-line tools used in conventional line-repair operations.

AUTOMATIC PURCHASING REQUISITIONS

Over 80-percent of general materials and supplies at Commonwealth Edison Company are controlled by a simple system involving mechanical review of stock balances . . . and purchasing through the use of automatically prepared requisitions.

By C. J. MAGNESEN, Purchasing Dept., Commonwealth Edison Company

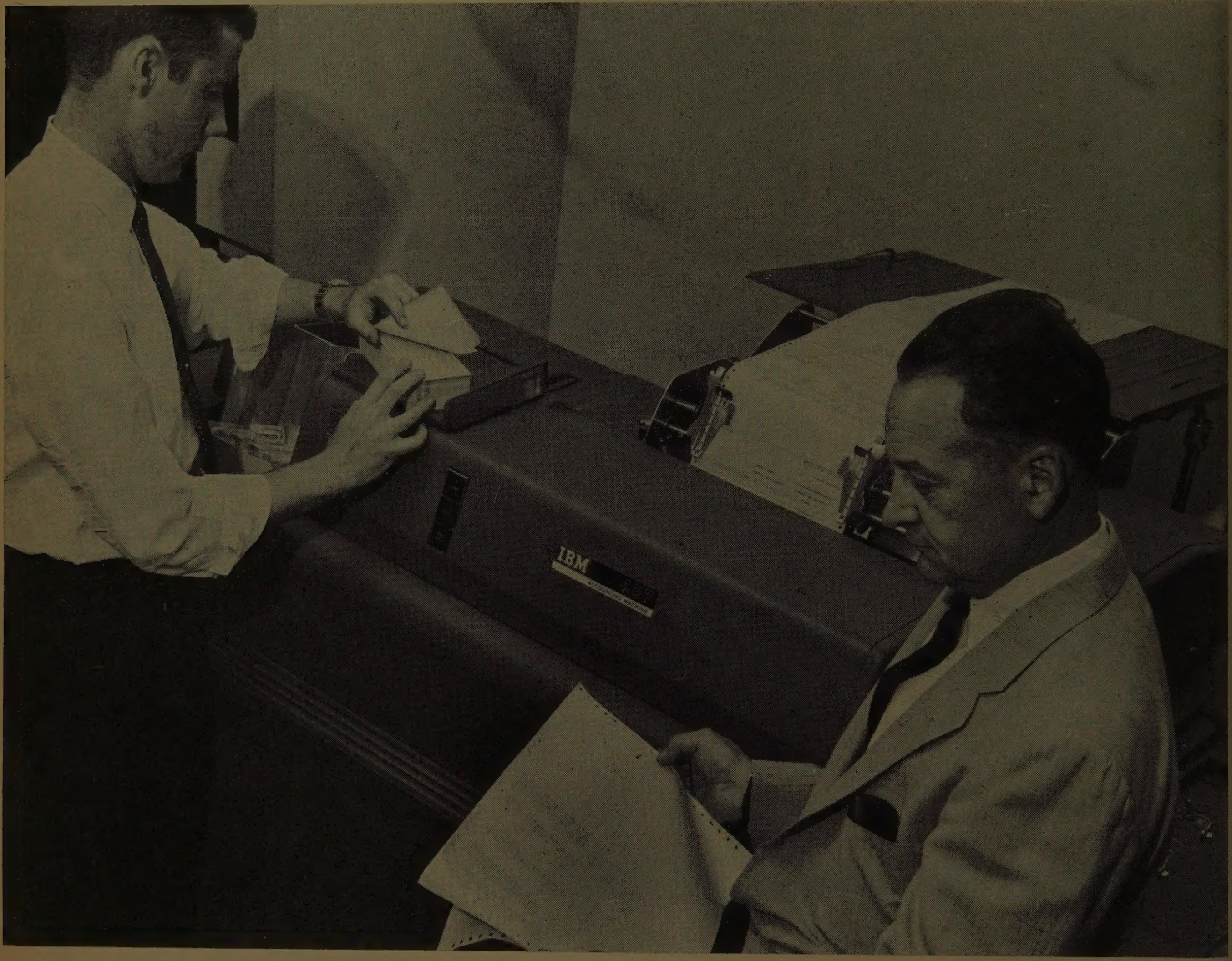


Fig. 4—An alphabetic tabulator (IBM 407) prints an average of 310 requisitions a week—a six hour operation. (Author Magnesen is at right of photo.)

A DECISION to develop a system of "automatic purchasing" was made about two years ago at the Commonwealth Edison Company when studies of the annual use of general utility materials and supplies showed that 85-percent of all stock items had a value per-stores location of less than $500 . . . and that, in the main, sufficient stock to cover one year's use was being carried in inventory for a substantial number of items.

Since December of 1959, we have employed a simple system which utilized mechanical equipment to review stock balances and to prepare requisitions automatically—showing the description, quantity to be ordered, receiving location, past use and other related data. The tab-card equipment applied to this method is the same as we use in our machine process inventory control.

This procedure not only provides a central purchasing control, reducing errors and expediting purchase order requisitioning, but it has also resulted in a reduction of clerical functions and has increased the amount of time storekeepers have to perform "management" functions.

Where a number of stores locations are involved on a utility system, such an automatic purchasing procedure is a logical development. This condition also prompted the adoption of it at Commonwealth, where inventory control has been

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Editor's note: This system, reported for the EEI Purchasing and Stores Committee meeting earlier this year, was developed and established under the direction of Robt. B. Gear, director of purchases for Commonwealth Edison Co. until his death on June 15, 1961.

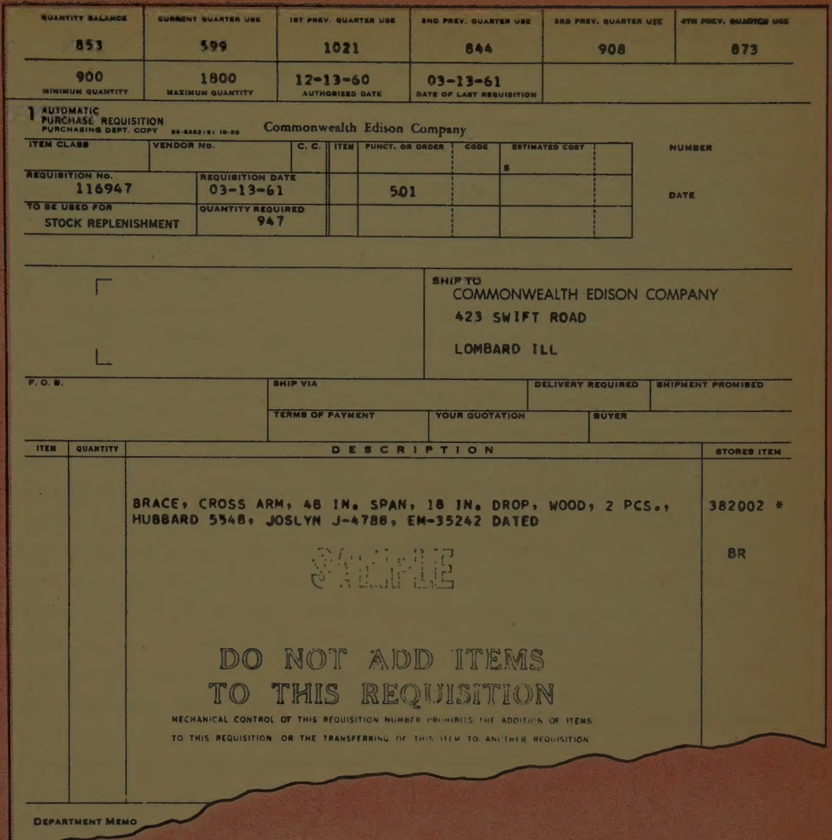
decentralized to separate stores locations since 1957.

Though the conventional bidding procedures (on specifications, from approved vendors) are still used in purchasing run-of-the-mill items in materials and supplies, about 60-percent of these purchases are now made on blanket purchase orders—with an average of about 175 purchases a week covering the needs of our system.

Stock management of general utility materials and supplies is accomplished by one of two methods —"Machine Review" and "Stores Location Review"—dependent on the basis of inventory review established for the particular item at the stocking location. Machine Review items are requisitioned, as required, by Machine Accounting issuing automatic purchase requisitions. The quantities on the requisitions are subject to the acceptance and approval of the Stock Location affected. Stores Location Review items are ordered as required by the stores location issuing regular purchase requisitions or purchase order releases. Initially, an annual use minimum of $500 seemed to be a fair break point between items to be considered for mechanical review and those to remain under manual or stores location review; however, this value has now been raised to $2500.

The Machine Review type of operation provides for the use of mechanical equipment to review current stock balances against predetermined minimum quantities and to print requisitions when the stock balance reaches a level where consideration for stock replenishment is indicated. The requisition produced is printed on a vellum type paper which permits purchase order reproduction by the ozalid process. (See Fig. 1.) About 6000 items, or 80-percent of the total items, are now on Machine Review, at upwards of 14,000 item locations.

Items not on Machine Review, are reviewed manually, and stock replenishment requisitions prepared at the Stocking Location, either as a result of visual observation of the stock level, or based on Balance and Use reports received from Machine Accounting, which show the current stock balance and



QUANTITY BALANCE	CURRENT QUARTER USE	1ST PREV. QUARTER USE	2ND PREV. QUARTER USE	3RD PREV. QUARTER USE	4TH PREV. QUARTER USE
853	599	1021	844	908	873
900 MINIMUM QUANTITY	1800 MAXIMUM QUANTITY	12-13-60 AUTHORIZED DATE	03-13-61 DATE OF LAST REQUISITION		

1 AUTOMATIC PURCHASE REQUISITION
PURCHASING DEPT. COPY 86-8862(8) 10-59
Commonwealth Edison Company

ITEM CLASS
VENDOR No.
C. C.
ITEM
PUNCT. OR ORDER
CODE
ESTIMATED COST $
NUMBER
REQUISITION No. 116947
REQUISITION DATE 03-13-61
501
DATE
TO BE USED FOR STOCK REPLENISHMENT
QUANTITY REQUIRED 947

SHIP TO
COMMONWEALTH EDISON COMPANY
423 SWIFT ROAD
LOMBARD ILL

F. O. B.
SHIP VIA
DELIVERY REQUIRED
SHIPMENT PROMISED
TERMS OF PAYMENT
YOUR QUOTATION
BUYER

ITEM	QUANTITY	DESCRIPTION	STORES ITEM
		BRACE, CROSS ARM, 48 IN. SPAN, 18 IN. DROP, WOOD, 2 PCS., HUBBARD 5548, JOSLYN J-4788, EM-35242 DATED	382002 * BR

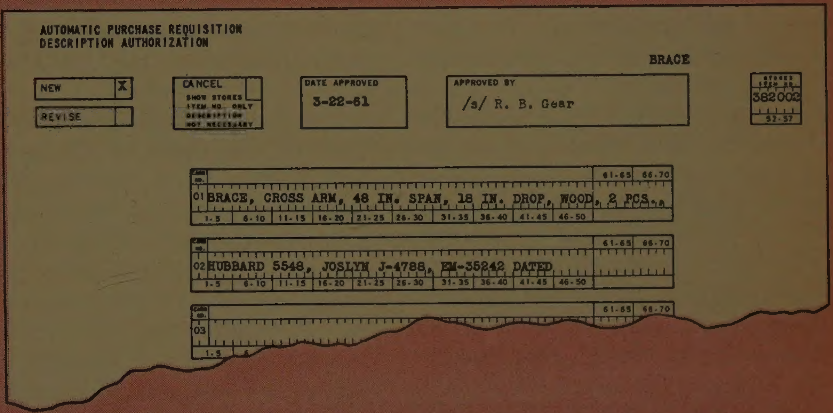
SAMPLE

DO NOT ADD ITEMS
TO THIS REQUISITION

MECHANICAL CONTROL OF THIS REQUISITION NUMBER PROHIBITS THE ADDITION OF ITEMS TO THIS REQUISITION OR THE TRANSFERRING OF THIS ITEM TO ANOTHER REQUISITION

DEPARTMENT MEMO

Fig. 1—Automatic Requisition, as storekeeper receives it, looks like an ordinary manually prepared requisition. But, to assist storekeeper in replenishing stock without referring to other sources of information, this form shows: quantity to be ordered, date the data was furnished, date of last requisition, current balance, use in present quarter, and use by quarter in past four quarters. Receiving location, stores item number and material description are all preprinted, so that no typing or proofreading is necessary.



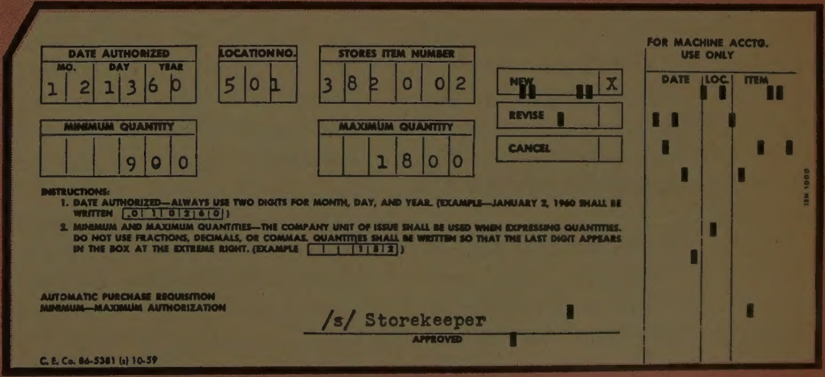
AUTOMATIC PURCHASE REQUISITION
DESCRIPTION AUTHORIZATION

BRACE

NEW ☒
REVISE ☐
CANCEL ☐ SHOW STORES ITEM NO. ONLY DESCRIPTION NOT NECESSARY
DATE APPROVED 3-22-61
APPROVED BY /s/ R. B. Gear
STORES ITEM NO. 382002 52-57

01 BRACE, CROSS ARM, 48 IN. SPAN, 18 IN. DROP, WOOD, 2 PCS.,
02 HUBBARD 5548, JOSLYN J-4788, EM-35242 DATED
03

Fig. 2—Automatic Purchase Authorization Description form identifies item by descriptions on separate punched cards, each card representing one line of description.



DATE AUTHORIZED MO. 12 DAY 13 YEAR 60
LOCATION NO. 501
STORES ITEM NUMBER 382002
NEW ☒
REVISE ☐
CANCEL ☐
MINIMUM QUANTITY 900
MAXIMUM QUANTITY 1800
FOR MACHINE ACCTG. USE ONLY
DATE LOC. ITEM

INSTRUCTIONS:
1. DATE AUTHORIZED—ALWAYS USE TWO DIGITS FOR MONTH, DAY, AND YEAR. (EXAMPLE—JANUARY 2, 1960 SHALL BE WRITTEN 010260)
2. MINIMUM AND MAXIMUM QUANTITIES—THE COMPANY UNIT OF ISSUE SHALL BE USED WHEN EXPRESSING QUANTITIES. DO NOT USE FRACTIONS, DECIMALS, OR COMMAS. QUANTITIES SHALL BE WRITTEN SO THAT THE LAST DIGIT APPEARS IN THE BOX AT THE EXTREME RIGHT. (EXAMPLE 182)

AUTOMATIC PURCHASE REQUISITION
MINIMUM—MAXIMUM AUTHORIZATION

/s/ Storekeeper
APPROVED

C. E. Co. 86-5381 (s) 10-59

Fig. 3—Minimum-Maximum Authorization, printed on regular tabulating card stock, shows date authorized, stock location number, stores item number, "min.-max." quantities.

manual use, by quarters, of the item. The Reports are issued weekly for those items which have had receivings, issues, transfers, or returns during the previous week. At present, there are about 2,000 items controlled in this manner, pending further expansion of the Mechanical Review System.

In the first 15 months the automatic requisition process has been used, an average of 310 requisitions were issued per week. In the same period there was an average of 75 cancellations per week, leaving 235 per week to be processed for buying. The cancellations were divided: 28% because items were secured from surplus, 46% items discontinued, 16% changes in quantities required, 9% duplicated items already on manual order, and 1% miscellaneous.

Controls Obsolete Materials

The system has special merit in "controlling" obsolete material. Many obsolete stores item numbers have been removed from the file earlier than they would be detected otherwise, thereby maintaining a "clean" inventory. Such requisitions, cancelled for discontinued, or obsolete, items amount to almost half of all cancellations.

The use of the surplus stock notice—prepared by storekeepers at stocking locations whenever they determine that there is a surplus of any item at their locations—accounted for the second largest number of cancellations of requisitions.

To solve problems which turned up in early operation of the process, these regular provisions were subsequently instituted—the Purchasing Department holds for an additional 30-day period, all cancellations of requisitions resulting from: (a) surplus transfers, after which they are returned to Machine Accounting for clearance of the records; and (b) changes in minimum/maximum authorization, which are reported to Purchasing in weekly listings by Machine Accounting.

Special control for two classes of supplies is provided. This is covered by the last card of the purchase description, so that the words will print on the requisitions. They are "Review Before Purchase" and "Central Stock."

Items with declining use, or semi-obsolete items, are generally of the type that carry the phrase "Review Before Purchase." Also included are those items which are of an emergency reserve nature and due to age or other reasons cannot be purchased. The requisition serves as a notice to the storekeeper that a replacement is needed and that purchase is questionable.

"Central Stock" items, towels, warning signs, concrete conduit, first aid kits, specifications paint, etc., are those which are maintained and supplied through a general warehouse. Requisitions bearing this designation are normally cancelled, and a transfer prepared by the stocking location. In this instance the mechanical review system operates to watch the stock balance and to advise when there is a need for replenishment. It serves a definite purpose by eliminating any need for a new weekly use and balance report each time there is an issue which is the case with the Stores Locations Review items.

How far one should go with the number and type of items on Mechanical Review is, at this time, still a question. Under present procedure, and with the type of equipment (ordinary "tab" cards equipment), certain items do not lend themselves to Mechanical Review. Included are items of classes of material that must be "bushel-basketed" in order to obtain quantities, substantial enough to attain the most economical price and delivery schedule. Other items, such as cable and poles, with their particular type of long range orders and deliveries, seasonal items, such as anti-freeze and tire chains, and short shelf life items such as batteries, have been individually eliminated from the mechanical review at this time. All that can will be added to the system as experience and improvements in methods of operation show the feasibility of doing so.

The estimate of the cost of a machine requisition and its supporting data is $0.74, based on the present average of 310 requisitions per week. Included in the charge are $117.00 per week for labor in machine accounting. It is estimated that 500 requisitions per week can be produced by the same process with an estimated overall increase in cost of only approximately 10 to 15%.

No credit has been taken for elimination of reviews necessary under Stores Location Review wherein a weekly report is forthcoming each time there are issues. Also, a savings is realized in that the mechanical review requisition has the past use readily available and shows the amount that should be ordered and the date of the last order, plus the fact that the descriptions require no proofreading. As new equipment is brought in, we expect the cost to be materially reduced.

At present an investigation is being made of the possibility of applying the mechanical review system to Generating Station Materials and Spare Parts. There are about 108,000 items involved, and due to the magnitude of the task, no one-time cut-over is contemplated. Approximately 10,000 of the items show a ready adaptability to the procedure and, as the items are active, they can be added. There are no weekly balance and use records readily available for the Generating Stations. With the use of some of the new high speed equipment including a "scanner" instead of manually key-punched tabulating cards, plus equipment similar to the IBM-1400 series, there is every possibility that the data can be made available which should result in a substantial savings in inventory due to a more accurate approach to requirements.

Simple, Automatic Control

To sum up this system: it provides a simple automatic control of quantities to be ordered which, in turn, affords adequate control of inventories. It reduces clerical work at stocking locations by eliminating typing of requisitions and some filing. It provides a very satisfactory method for disclosure and elimination of obsolete items, and places a warning flag on items of dubious future use by calling for a review before purchase. It permits automatic stock control for centrally stocked items and, finally, it has possibilities of being expanded to cover spare parts and other items of infrequent use economically.

HOW COMMONWEALTH EDISON'S AUTOMATIC REQUISITIONING WORKS

There are five basic documents used in the system: (1) The Weekly Balance Forward card, (2) Minimum-Maximum Requisition Authorization, (3) the Purchase Description Authorization, (4) an On Order Record, and (5) Requisition Card. (This latter card is prepared at the same time as the corresponding requisition. If the requisition is not cancelled, it becomes the "On Order" card.)

IBM key punchers, sorters, collators, tabulators and a reproducer are required.

The Weekly Balance Card is prepared by key-punching tabulating cards for all receivings, issues, transfers, and returns. These cards are accumulated and "worked" once per week.

The active cards, plus the matching Balance Forward cards are sent through the 419 tabulator, which summarizes the activity and either increases or decreases the balance and prepares a new Weekly Balance Card. To facilitate handling, and to expedite overall processing, this deck is duplicated so that both mechanical review items and Stores Location Review items can be processed simultaneously.

Step 1 in preparing for the issuance of automatic requisitions consists of preconditioning the "On Order" deck. To do this the Balance and Receiving deck is processed, or collated, against the "On Order" deck—to remove the On Order cards for complete shipments and to reduce the quantity on order by the amount of the partial shipments. The new Balance Deck thus prepared consists only of those items which had activity, receivings, issues or returns, during the previous week. It is then matched with the min/max deck and merged into one deck.

For ordering purposes, these questions are answered at this point: (1) Are any of the items below the minimum? (2) How much should be ordered?

From the results of the test a new requisition summary card is prepared which contains the Stores Location, stores item number, quantity to order, and requisition date. The Requisition Summary Cards are then assigned a requisition number. (A No. 604 multiplier ensures that all requisitions carry consecutive numbers.)

The requisition card is collated to the min/max balance deck. The min/max and balance cards for items not to be ordered are removed and returned to file. The new deck consists of: (1) Min/max card, (2) Balance card, (3) Requisition card (this latter card is "gang-punched" to show it is an "On Order" card).

When it is necessary (due to unusual requirements or a special job) for a stores location to independently order material which is controlled on a min/max basis, a regular purchase requisition is prepared by the stores location and processed in the regular manner.

This deck is collated against the Purchase Order Description deck to obtain the purchase descriptions and unit of issue (maintained on the last card of each description.)

The requisitions are printed in duplicate using a 407 tabulator. This machine has a header card which contains the address of the stores location concerned.

The original of each Purchase Requisition is forwarded to the Purchasing Department and the duplicate copy to the Stores Location which sent in the min/max authorization.

The Stores Location receiving the copy of the purchase requisition reviews the proposed order, and decides, based on current conditions, whether to allow the order to proceed, to revise the order, or to cancel it. If the order is to proceed, no further action is necessary, and the copy of the requisition is filed pending receipt of the receiving ticket and accompanying copies of the release or purchase order. If the order is to be revised or cancelled, the Purchasing Department is notified by telephone as to the action to take. In the case of a revision or cancellation, the stores location initiates a revised min/max authorization to change the "min/-max" quantities as appropriate.

The Purchasing Department holds the automatic Purchase Requisition for 5 days from the date of the requisition to allow for any action by the stores location. If no notice to change the requisition is received in the period mentioned, the item will be ordered. (Buyers are permitted to change the quantity to buy, to the nearest standard buying quantity. For example, if the quantity required appearing on the requisition is 404, and standard packaging is 100, the quantity ordered will be 400.)

When the requisition is cancelled, the Purchasing Department holds the requisition for 30 days to permit transfers of surplus, revisions of min/max etc., to clear the accounting records and then notifies Machine Accounting to cancel the "On Order" card.

The "control point" for the mechanical review requisitions is in the clerical group of the Purchasing Department, where each week, originals of the requisitions are sorted before processing.

APPLE GROVE TEST LINE ENERGIZED AT 775 KV

New 750-kv transmission research project features simultaneous independent RI readings on three lines with dissimilar conductors. Heating current in conductors simulates actual system operation.

A SIGNIFICANT ADVANCE in electric power research was made on June 22, 1961, when a test transmission line was energized at a record-breaking 775 kv. The line was built by the American Electric Power System and Westinghouse Electric Corporation, with assistance from six other manufacturers, at a total cost of $2-million.

The energizing ceremony, attended by national, state and local civic officials, industry leaders and the press, marked the start of a five-year program of tests.

Speakers at the ceremony included Governor William W. Barron of West Virginia, who pushed the energizing button; Philip Sporn, AEP president; A. C. Monteith, vice president of Westinghouse and general manager of its apparatus products division; and R. E. Hodges, vice president and general manager, Appalachian Power Co.

"At the end of the five-year test period," Mr. Sporn declared, "we expect to be in a position to project, design and construct transmission lines at voltage levels as high as any that may be necessary to meet the needs of the country between now and the year 2000."

Prime Objectives

Prime objective of the project is to obtain data on corona loss and radio influence (RI) performance of conductors at a nominal voltage of 750 kv to determine technical and economic feasibility of transmitting large blocks of power at this extra-high voltage.

Information on conductor size and configuration, insulators, spacers, bushings, connectors, hardware, and structural data will be of value in determining line design. Operating experience with transformers, lightning arresters, coupling capacitors, and line traps will help in the future design of terminal apparatus for 750-kv operation.

Physical Layout

The new test line is constructed on a possible future generating site for Appalachian Power Company at Apple Grove, West Virginia, about 25 miles up the Ohio River from Huntington, West Virginia.

A 138-kv tap off of a double-circuit line between South Point, Ohio, and the Philip Sporn plant at Graham Station feeds the test line through a three-pole load-break disconnect switch to the 138/750-kv autotransformer and then to a 750-kv bus structure.

One of the three line sections shown in the accompanying sketch uses conductors of 1.382-inch-diameter (1272 mcm) steel-reinforced aluminum conductor (ACSR). The second line section uses a smaller conductor on all three phases: 1.196-inch-diameter (954 mcm) ACSR. The third line uses a combination of the two sizes: the two outer phases have the smaller cable; the center phase, the larger since this conductor has greater voltage stress on its surface.

The three-phase lines use bundled conductors—four separate conductors on 18-inch centers comprise each phase.

Special Features of the Line

Two special features of the line warrant particular attention: simultaneous independent RI readings can be taken on each of the three lines; and since no load is supplied by the line, heating current is provided to simulate actual system operation.

To permit simultaneous independent RI readings on each of the three lines, decouplers (blocking filters) for radio influence frequencies have been installed between the three lines so that the interaction of the radio noise generated on one line section will be minimized with respect to that produced on another line section.

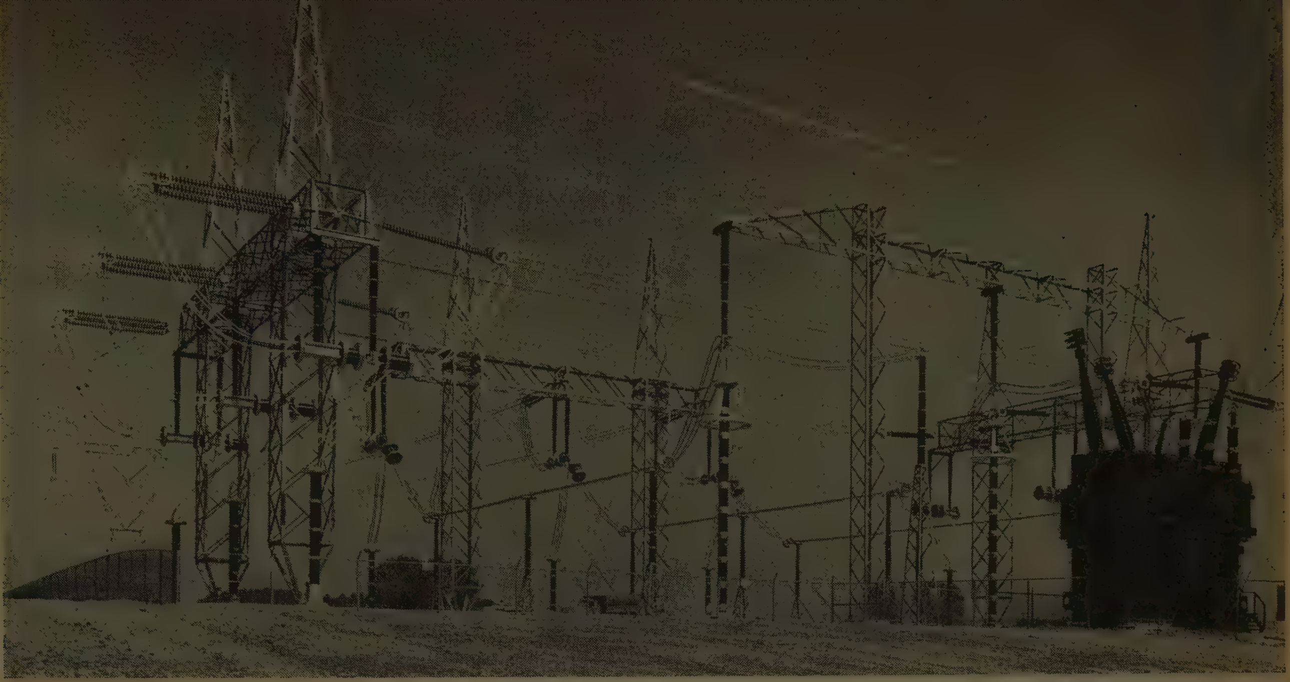
The primary need for current is to continually keep the conductor slightly above the ambient temperature to prevent condensation on the line, which generally increases the corona loss and radio noise generated.

The tests will be completely instrumented, using magnetic-tape data logging equipment to allow maximum information to be accumulated and analyzed. Effects of various atmospheric conditions will be assimilated into this data for proper statistical analysis. Comparison of the Apple Grove data with that of previous high-voltage projects, such as the Leadville and Tidd lines, and others will allow evaluation of test procedures, instrumentation, and verification of results.

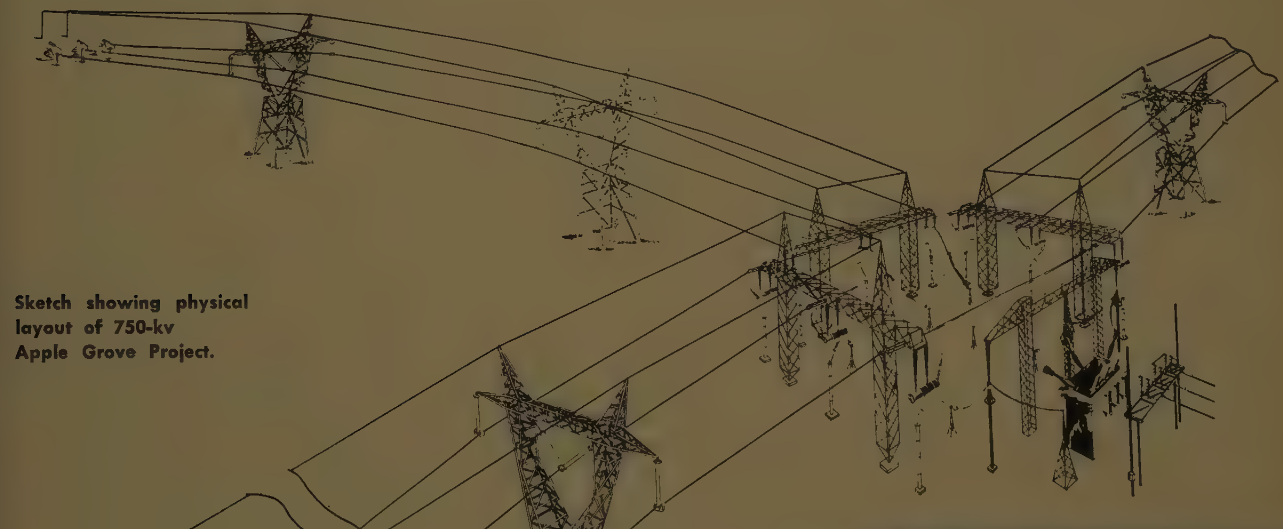
Readings of about 50 test quantities on the line will be taken by the data logger and recorded every twenty minutes. Whenever test readings fall outside predetermined limits, the data logger will scan and record readings every two minutes until the values fall back into line.

Readings taken will include: temperature, relative humidity, air pressure, wind direction and velocity, radio influence, coronaloss, rainfall, and air contamination.

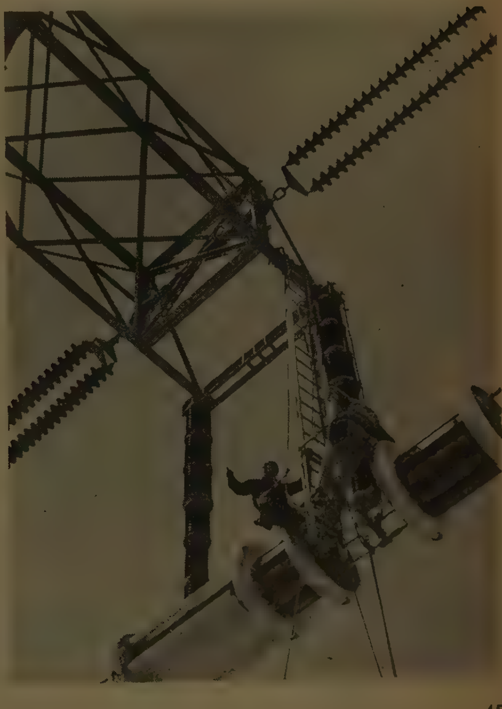
Companies also participating in the cooperative venture and the equipment or materials they supplied are: Kaiser Aluminum and Chemical Corporation, conductors; Lapp Insulator Company, Inc., and Ohio Brass Company, insulators and hardware; The Thomas & Betts Company, connectors; American Bridge Division of United States Steel Corporation, towers; and Armco Steel Corporation, steel for the transformer.



View of substation for 750-kv Apple Grove test project, showing the three 2400-ft-long line sections running to left, right, and behind the substation.



Sketch showing physical layout of 750-kv Apple Grove Project.



One of the decouplers for isolating the three lines for radio-influence measurements. At left is the housing for the coronaloss wattmeter, heating transformer, and series capacitor to maximize heating current. The two black "spools" are the two- and five-millihenry chokes (left to right) for the decoupler. Linemen are preparing to connect the lead from the coupling capacitor between the two chokes.

HOW TO DRASTICALLY REDUCE LINE-DEPARTMENT COSTS!

Optimizing its line-crew organization through scientific analysis has enabled one utility to effect a contining annual saving of $175,000.

By STANLEY W. ANDERSON, PhD., Operations Research Specialist, Middle West Service Company

THERE IS AN OPTIMUM number of crews and an optimum crew size for the line operations of any utility. And the company which fails to make a precise, tailor-made determination in this area is simply encouraging the accumulation of expendable fat.

For instance, a middle-sized, progressive utility in the middle west had followed the nominal tradition of seven-man crews for many years, applying a varying number of crews. A study was made of line operations, and it was recommended that the optimum size was a three-man crew for this company. As a result, this company is now realizing a continuing annual savings of $175,000.

This does not mean that an optimum crew size and number has been found for utilities per se, but only that certain conditions demand a certain crew efficiency. The immediate reaction of management to this assertion was, of course, how does one relate to the other? Here is the step-by-step procedure for establishing optimum efficiency in line operations.

Start With Factual Groundwork

For one thing, all pertinent data relating to crew performance for a specified period of time was reviewed carefully. This means dates, job descriptions, crew sizes, required man-hours for completion, travel distance, travel time, specific trouble, maintenance, blanket work-order jobs and even such conditional factors as inclement weather, vacations, illnesses and time-off periods were laid bare. Also, payroll records were scrutinized.

The idea was to assimilate all of these factors so that job frequency versus man-hours could be plotted for each division. Fig. 1 shows the number of jobs requiring a certain number of man-hours of work during the period of study.

What we were after, of course, was crew efficiency, so that we could determine expected crew efficiency for various crew sizes. That is to say, the ratio of useful working man-hours to total working man-hours is the initial step in the determination of expected crew efficiency. Incidentally, the ratio fell within our firm's standard—which is based on previous studies—and is certainly considered one of the keys to the establishment of optimum crew size. (See Fig. 2.)

Apply Operations Research

Once the factual groundwork of conditional data provided a solid base, the mathematics of operations research was brought into play. However, the divisions represented different loads, travel times, and other varying conditions, and therefore, mathematical models were set up for each division rather than projected across the board.

Crew cost was then broken down into its components such as working-time cost, travel-time cost, vehicle cost, non-productive time cost and the cost of essential non-variable personnel. The model for one division looked like this:

$$C = \frac{540\,N^2 + 250\,N}{1.129\,N - 1.29} + \frac{2160}{N} + 12903 + 1700\,N \qquad (1)$$

N = number of men per crew
C = cost in dollars

In addition it was necessary to set up a working model to determine the number of crews. This determination, of course, had to fall within the framework of limiting conditions such as safety requirements and union regulations which dictate a minimum of three-man crews. Here is the mathematical model for relating the number of men per crew with the number of crews:

$$M = \frac{1.08\,N}{1.129\,N - 129} + \frac{9.70}{N} + 3.40 \qquad (2)$$

M = number of crews

Finally, we were ready to transpose symbols into dollars-and-cents savings. The value of N is impractical which gives minimum cost in equation (1) because it is less than the limiting value of three men.

Cost-conscious company planners were very much interested in the graphic illustration found in Fig. 3, curve 2. It is a plot of equation (1) and compared clearly the cost to the company of sufficient N-man crews to accomplish the same amount of work as present crews. The economic choice for this division was obviously a three-man crew. Then when N = 3 is substituted in equation (2) management could see that there should be nine three-man crews in the division.

If contrary to fact we could assume that all size crews are equally 100% efficient, then it is not difficult to plot crew cost. (See Fig. 3, curve 1). Interestingly, there is a value of N which gives minimum cost here also. In this case, based on data collected, the value of N which will provide minimum cost is four men.

Management now had a clear picture of present costs and projected savings in the line department. The decisions in this area were made for them by the intelligent application of factual data. Actual salary cost for the period under consideration was approximately $28,300. Vehicle cost for this period was $1100. Total cost was, therefore, $29,400.

If N = 7 is entered into Fig. 3, cost for the period was found to be approximately $29,400, a very good check with actual. Now, when nine three-man crews were installed payroll cost approximated $280,000 annually, while vehicle costs ran about $23,000. Since the original annual cost approximated $353,000 for one division only, the savings for this division was $50,000 annually. Therefore, the over-all continuing savings for the line department approximated $175,000 in the first year of revision.

The present urgent need to reduce the cost of operations has drawn management closer to the scientific approach to decision making. The alliance is proving more and more compatible. Probability theory, linear programming, statistical analysis and other facets of operations research are, if nothing else, reducing the area of decision-making to a sharp focus. The results in terms of increased operational efficiency at lowered costs are almost unbelievable.

FIGURE 1

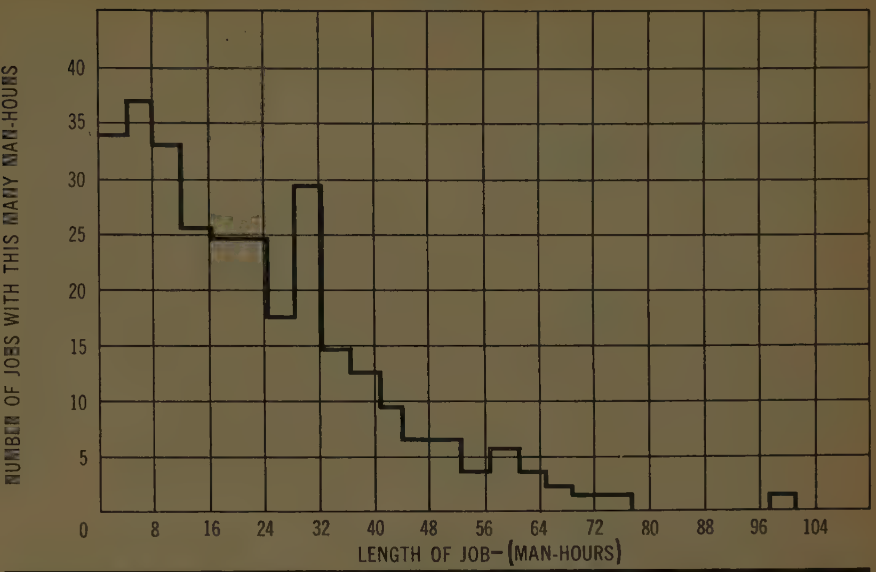


FIGURE 2

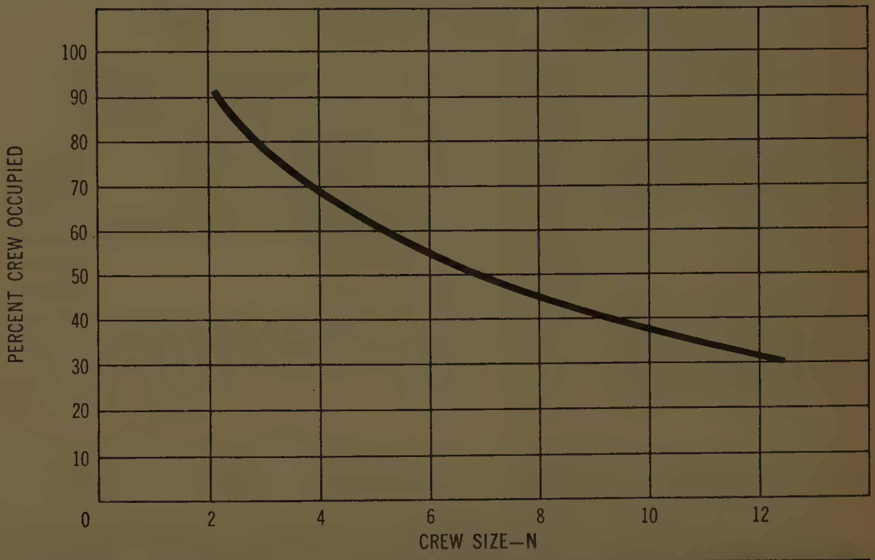
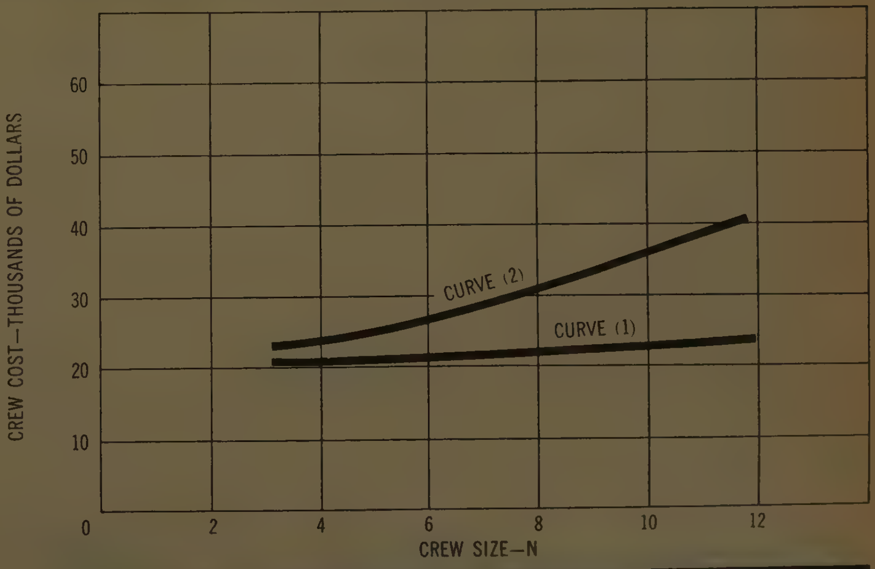


FIGURE 3



COPPER-SILVER ALLOY SAVES CON EDISON THOUSANDS

How the use of a copper-silver alloy in commutators, rotors and squirrel cage windings has saved one utility several hundred thousand dollars in material, repair and downtime costs.

By HOWARD BLANK
Assistant Manager of Technical Services
Amco Division
American Metal Climax, Inc.

A SPECIAL copper-silver alloy has enabled four large Consolidated Edison Company generators to help supply the extreme cyclical power requirements of New York City for more than 15 years without a single rotor breakdown because of winding material failure. This has saved the company several hundred thousand dollars per generator in material, repair and downtime costs. In addition, the special alloy provides a built-in safety factor at a nominal cost.

Developed by the Amco division of American Metal Climax, Inc., the alloy contains an oxygen-free high-conductivity copper (OFHC)* with 10 to 12 oz of silver per ton.

Long Experience

Use of the copper-silver alloy in commutators and in rotor and squirrel cage windings was pioneered back in the early 1940's by Con Edison and electrical equipment manufacturers in their search for a material that would eliminate frequent rotor winding failures, thereby reducing costly downtime and expensive repairs.

In adopting the new copper-silver alloy, for example, Con Edison rewound each of the four generators for the last time in 1942, 1943, 1944 and 1945, respectively. They have not been rewound since, and show promise of operating for years to come.

Prime Advantages

OFHC has two prime advantages which make its use attractive to utilities. Hydrogen embrittlement during brazing and soldering is sharply reduced, thus increasing the strength and performance qualities of the windings under operating conditions. The windings made of OFHC also maintain their strength under the repeated heating and cooling during the loading and shutting down of the generators, a daily occurrence for many Con Edison units.

The addition of silver to OFHC gives extra assurance at a small

TABLE I

EFFECT OF SILVER ON SOFTENING

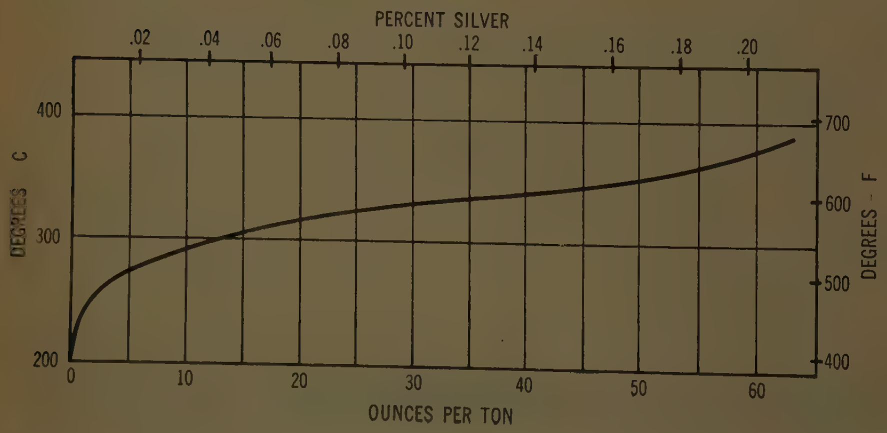
Cold Work	E.T.P.	OFHC Brand	OFHC Brand plus 15 oz/ton Silver
90%	1 day	2 days	1 year
50%	1 week	2 months	10 years
30%	1 month	1 year	30 years
20%	3 months	8 years	100 years
10%	1 year	75 years	
5%	3 years		

TABLE II

SHORT TIME CREEP TESTS AT 572 F (300 C)

Material	Percent Reduction	Stress PSI	Total Creep Percent	Creep Rate Percent Per Hour	Total Test Time Minutes
OFHC	5	12,500	0.26	.0062	1490
OFHC plus 15 opt Silver	5	12,500	0.16	.0045	1440
Tough Pitch plus 15 opt Silver	5	12,500	0.58	.0192	1440

Fig. I—Effect of silver on softening temperature of OFHC copper.



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*® OFHC is a trade name of American Metal Climax, Inc.

xtra cost. This is why Con Edison pecifies the copper-silver alloy for ll of its rotor windings.

Benefits

Benefits of the special alloy to ublic utility companies can be emonstrated by the following typial example:

A large, modern generator might ost approximately $4,000,000. Its 00,000-lb weight would contain aproximately 33,000 lb of copper-ilver alloy in the rotating compoents and 24,000 lb in the stationary omponents—57,000 lb of copper-ilver alloy overall.

By paying a premium of eight ents per lb for the copper-silver lloy—four cents per lb at the efinery and four cents at the fabicators—electrical equipment manufacturers can achieve almost indefinite winding life for an added cost of only $4,500 in a $4,000,000 machine.

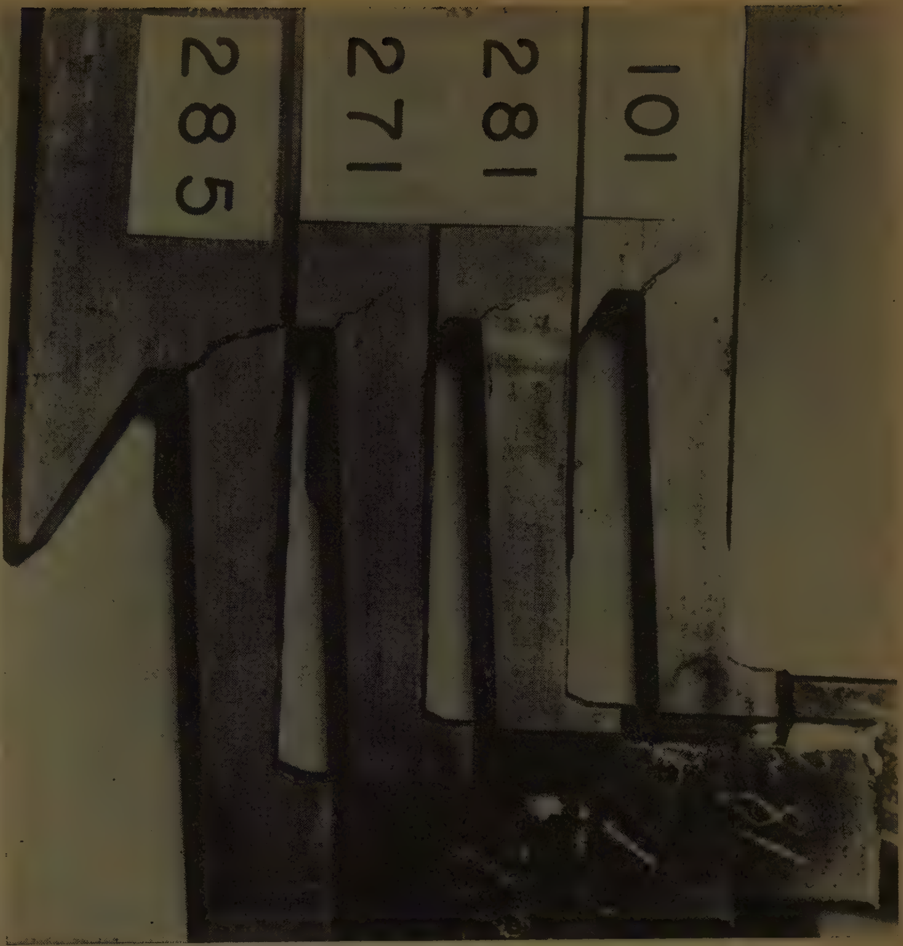
How small this assurance cost is becomes evident when the high costs of repair and downtime are considered. It might cost up to $700,000 to rewind a generator of this kind. In addition, downtime losses would grow at a rate of about $10,000 to $15,000 per day for periods ranging up to six weeks or more, depending upon the speed with which repairs can be made to get the generator back in operation.

Performance

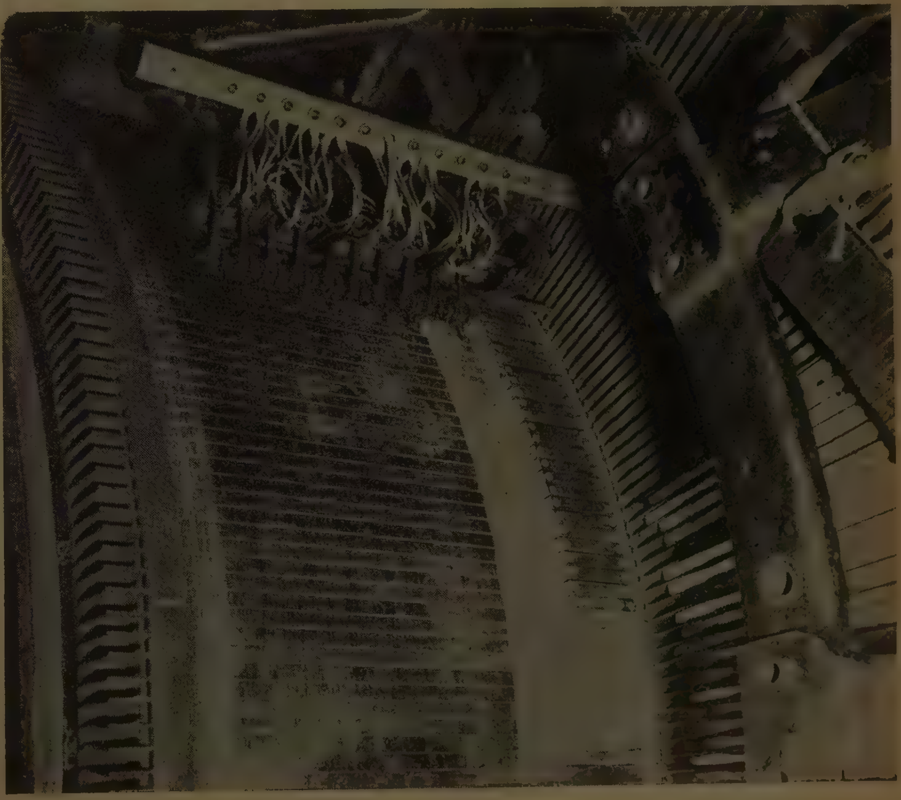
In the early stages of its market development, copper-silver alloy users had to rely upon performance data developed by Amco research engineers and independent research organizations retained by Amco.

Fig. 1, for example, shows the effect of silver on the softening temperature of OFHC copper for a range of silver contents up to 60 oz per ton. Significant is the fact that the effect of silver is much greater in the smaller increments, between 10 and 20 oz per ton, where optimum properties can be obtained most economically.

The effect of silver on softening can be shown also on a time basis. Table 1 is compiled from an investigation sponsored by Amco at Battelle Memorial Institute. The time required for 50 percent softening at



Above, cracks such as these occur in commutator rotor bars when cyclic forces exceed the lower yield point which results from hydrogen embrittlement during brazing or soldering. Addition of 10 to 12 oz of silver per ton of OFHC Brand oxygen-free high-conductivity copper raises the yield point well above the danger level and provides virtually indefinite performance life. Below, example of the costly and time-consuming replacement of commutator segments in a 4000-kv rotary converter. Replacement of bars is so complicated that workmen can normally repair only three or four of the 400 segments in an eight-hour shift.



Copper-Silver Alloy

300 F, together with the effect of the degree of cold work is shown in Table I.

Increased Life

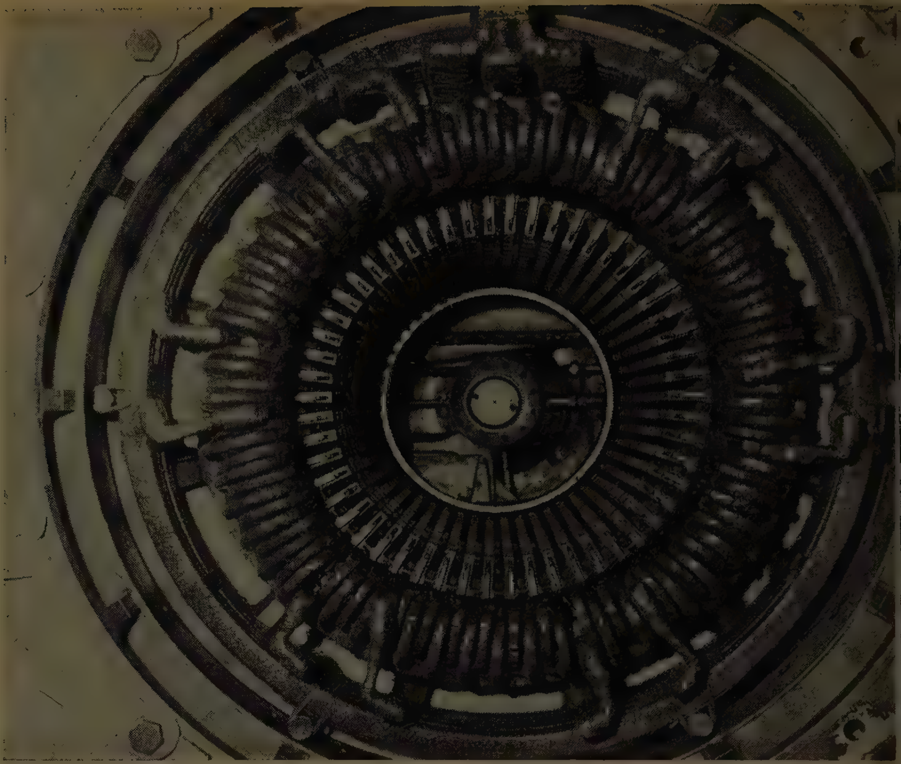
By compromising on the final temper of the copper, a marked increase in useful life is obtained. Moreover, OFHC copper containing 15 oz of silver per ton, half hard, will resist softening almost indefinitely, even at temperatures as high as 300 F.

The resistance of OFHC plus silver to softening at such temperatures meets rotor and conductor winding performance standards since failures of conventional copper take place in the range of 150 F to 170 F.

While creep and annealing effects are small at such temperatures in generator operations, they are nevertheless important because of the long life requirements of power plant equipment. A life of six to eight years in conventional overhead lines, for example, is generally satisfactory. Generator equipment, however, must perform many times that span to permit economical operations under today's high cost of doing business.

Creep Is Important

Thus creep is an important factor in electrical generation requirements. Information in Table II, also developed by Battelle Memorial Institute, shows the superiority of the copper-silver alloy over OFHC itself and over tough pitch copper with silver added.



Although this 6,000-hp motor is not subjected to the same rigid temperature and load cycles as the large turbogenerators, its windings nevertheless require the same copper characteristics as the larger machines. OFHC Brand oxygen-free high-conductivity copper plus 10 to 12 oz of silver per ton assures such required characteristics.

Typical stator winding of a large turbogenerator using an OFHC copper-silver alloy which permits relatively fine strands to be brazed or soldered without embrittlement, thereby enabling the strands to withstand extreme temperature and load cycles which would otherwise cause frequent failure with the use of conventional copper.

CONCRETE PLACEMENT GIGANTIC CHALLENGE AT GLEN CANYON

By 1964, five million cubic yards of concrete will have been placed in the Glen Canyon dam—a $108-million contract job. Total project will cost $326-million and will generate 900,000 kw.

ONE OF THE MOST gigantic concrete placement jobs in construction history is taking place at Page, Ariz.—site of the Bureau of Reclamation's $326-million Glen Canyon Dam Project. Twenty-four cubic yards of concrete are being placed every 2¾ minutes, 480 cubic yards every hour—a maximum of 24 hours a day. This will continue until early in 1964 when five million cubic yards of concrete will have been placed in the dam. In addition, 225,000 cubic yards of concrete will be required to erect the power plant. Nearly 150,000 cubic yards of concrete were used in forming the already completed 6000-ft-long diversion and spillway tunnels.

The project requires use of three million barrels of cement and 220,000 tons of pozzolan.

Concrete is mixed in a 217-ft-high batch plant, perched on a ledge carved out of rock on the west side of the canyon wall. This plant is playing a major role in speeding construction of the dam, along with highly reuseable steel forms and mammoth concrete buckets, both of which were specially designed and fabricated for the job by Blaw-Knox Company, Pittsburgh. The buckets are the largest of their type in the world.

The $108-million contract for Glen Canyon Dam is the biggest construction contract ever awarded by the Department of the Interior. Merritt-Chapman & Scott Corporation, New York, is the general contractor.

A "big brother" in appearance to Hungry Horse Dam on Montana's Flathead River, Glen Canyon is designed as a high concrete arch structure 300 feet thick at base and 35 feet thick at crest. Width of the dam at crest will be 1500 feet, and 1200 feet in a rim-to-rim line at abutments.

The power plant will be positioned 300 feet downstream from the dam. Total output—900,000 kilowatts—will provide 80 percent of the electrical energy authorized in development of the Upper Colorado River Storage Project. Other figures are equally impressive—130,000 acres of newly irrigated land, improved irrigation on 230,000 additional acres, and a 186-mile-long man-made lake.

To construct this project, started in 1956, the Colorado River had to be diverted to flow through the two huge tunnels—one bored through the canyon wall on each side of the dam. The river's bed is dry now at the dam site. Cofferdams, across the floor of the canyon upstream and downstream from the foundation area, protect the working site.

Excavation totalled 3¼ million cubic yards of earth and rock. Deepest excavation to bedrock in the dam foundation is 137 feet below former river level.

Many of the materials in use—such as the B-K forms and buckets—have been trucked 134 miles from Flagstaff, Ariz. Cement is trucked 188 miles from the new American Cement Corporation plant near Clarkdale, Ariz. Aggregate comes from Wahweap Creek, six miles from the dam, in large bottom-dump trucks. Pozzolan, the natural cement-like material that is a silicous volcanic ash, is trucked from Flagstaff. This material reduces shrinkage in concrete and reduces heat in concrete during the curing period.

The batch plant—equivalent in size to a 20-story building—is operated at maximum capacity. A total of 480 cubic yards of concrete are mixed each hour in six 4-cubic-yard mixers. From the batch plant, concrete is moved in ladles mounted on electric rail cars and then transferred to two concrete buckets, always in operation except for rotation with two other identical B-K units.

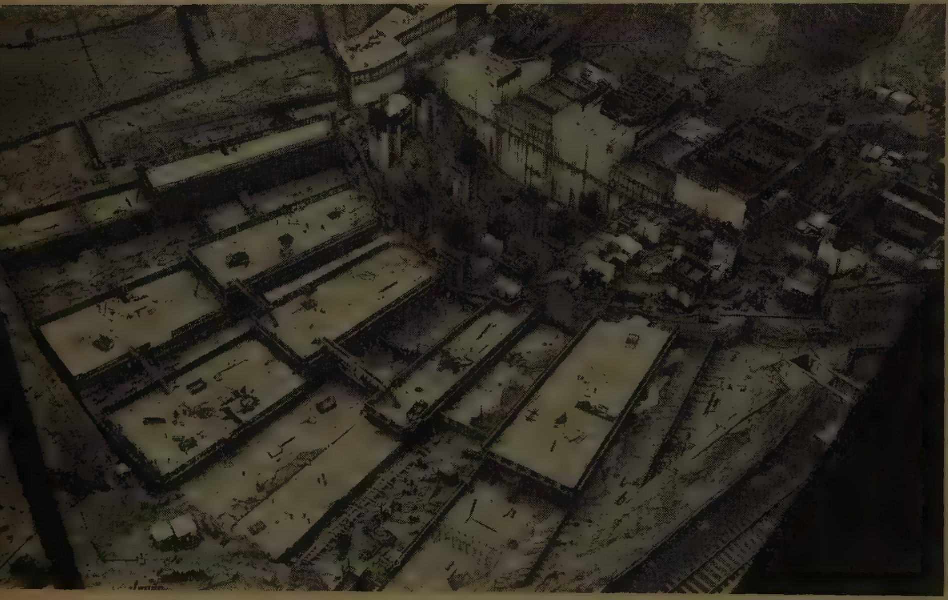
To move the buckets from beside the batch plant rail car, Merritt-Chapman & Scott employs highline cableways. Two of these highline cables—four inches in diameter—are mounted on 190-ft-high steel towers positioned 2000 feet apart on opposite canyon walls. These 50-ton-capacity cableways are the largest ever built. A third cableway, completed late last year, has a 25-ton capacity.

Each of Glen Canyon's huge buckets weighs seven tons and moves 24 tons of concrete—or 12 cubic yards—to placing locations. Maximum vertical travel is 535 feet and a complete cycle is clocked in 2¾ minutes. The buckets travel up and down stream at a speed of 120 feet per minute, across the canyon at 1400 feet per minute, and vertically at 600 feet per minute.

Each of the self-powered hydraulic buckets features a roller gate opening that measures 4-by-4 feet and can be stopped in any position. Bucket operation permits dribbling of concrete. The unit is capable of three-cycle manual operation without charging. It hangs from the cableway on two 1¾-in. diameter wire ropes.

Concrete is placed in 7½-ft lifts,

Over-all view of the Glen Canyon Dam project.



This panoramic view, of concrete placement in upstream and downstream faces at Glen Canyon Dam, was taken from the rim of the canyon.

Seven and one-half foot lifts are fashioned here through use of highly reusable steel cantilever forms, specially designed and fabricated for the Glen Canyon Dam Project by Blaw-Knox Company, Pittsburgh.

This 20-story-high batch plant's capacity is 480 cubic yards an hour. Concrete is moved from the plant in ladles mounted on an electric rail car and emptied into Blaw-Knox buckets which move via cable

many of which measure as much as 70 by 170 feet and contain 3500 cubic yards. One of these larger lifts can be placed in less than eight hours.

The lifts are shaped through use of the reuseable B-K forms, lowered by cable to the placing site. These specially designed steel cantilever forms—each of which M-C&S reports can be employed as many as 100 times to reduce other costs considerably—are used to place all concrete for the dam, including facing of 4½ million square feet of contact surface.

Approximately 1600 men are employed on the project by M-C&S.

Glen Canyon Dam will be the third largest structure of its kind in the United States. Only Grand Coulee and Shasta will have a larger volume of concrete. Glen Canyon's 710-ft height will make it second only to Hoover (726 feet) in the United States.

Glen Canyon will be the largest in a system of storage dams and reservoirs of water in the upper basin of the Colorado River. The dam will aid in regulating river water to fulfill commitments to the lower basin. Sale of hydro-electric energy generated at this and the other dams is expected to amortize cost of all the projects, planned by the Department of the Interior's Bureau of Reclamation.

Water from the four storage reservoirs planned will generate about 1.2 million kilowatts of electrical power. The Glen Canyon plant alone will have eight 155,500-hp turbines planned to drive eight generators with an installed capacity of 112,500 kilowatts each. This will provide the seventh largest electrical plant output in the world.

Construction of the dam will permit mining of uranium and other mineral deposits in the area below the concrete structure, and flood control and irrigation will be possible. Behind the dam, there will be a new and beautiful recreational area—Lake Powell.

In the early phases of construction on the dam and its related facilities, Kiewit-Judson Pacific Murphy, a joint venture, constructed the highest steel arch bridge in the world. This bridge provides access from one side of the canyon to the other—2000 feet—at the project site; otherwise 200 miles around by road.

MANAGEMENT-MARKETING

Utility PR: Crisis

How Con Edison Handles Big Town Power Failures

What the customer thinks about the power company *when power fails*—this puts to the test all of the utility's "relations" assets of the past, to an extent where it might be concluded that such an unlucky company can't win for the moment anyway.

Yet, this is just where "winning" can be the sweetest . . . or certainly where "losing" on the relations fronts can be most damaging.

How did the June 13 outage, which lasted 4½ hours on one network, affect the New Yorkers who live or work in four mid-Manhattan network areas that were blacked out? The level-headed way the people accepted the blackout convinces Charles E. Hoppin, of Con Edison's Public Information Bureau, "that the average New Yorker knows that things sometimes bust and has confidence in Con Edison's ability to fix them as quickly as possible."

The director of the bureau, Veteran Bill Brady says: "New York is different." He refers to the "unique" way in which about 50 news sources in the big town "go after us" for up-to-the-minute reports when such a major emergency hits the company.

More than ever at such a critical time, the utility's "relations" are in the hands of the press, too. That's why the best solution is to have competent people available "when every phone in the office starts to ring," comments Chuck Hoppin.

"We do know that it helps to have someone at the System Operator's Board, which serves as a command post for directing restoration of service. Bill Brady went up there as soon as we knew we were in trouble and stayed until about 10:30. In the meantime, down here in the office we had four girls and six men answering phones and giving information.

Public Relations Challenge

"From Bill Brady we were able to get the areas affected. And from our network maps we gave accurate boundaries to the newspapers. As the trouble was identified, and as steps were taken to test and restore equipment, Bill fed us the facts so we could keep a running flow of progress reports going to newspapers and radio and TV news desks.

"By and large we think the news media did an objective and highly competent job. Both the reporters and ourselves are under the pressure of putting a fast-breaking story together. We must supply authoritative facts. The reporters want them, and color and drama, too. They are not impressed by technical explanations. While a mere reading of press reports may create a mis-leading idea of public reaction to the emergency, they also mirror the concern of a great city and the plight of the people directly affected. The real heroes are the men who found the trouble and fixed it."

From Chairman Forbes down, Con Ed spokesmen helped to sustain the utility's good PR image.

. . . and Day-to-Day

Customer Relations Line For Wisconsin P.&L. Co.

How do we meet the "relations" challenge posed by our customers in our daily field operations? W. S. Johnson, public information director of Wisconsin P. & L. Co., summarized his views recently . . . beginning with recognition of the average customer's "total unconcern with the problems of bringing his electric service . . ."

"First, of course, we're going to want to continue extending every effort to give our customers—all of them—the best possible electric service, day after day, at the lowest reasonable rates.

"Second, as you go about your daily business of providing top-flight electric service, travel the "extra mile," wherever and whenever you can, to give the customer that little additional courtesy and that little bonus attention to which he is not, strictly speaking, entitled —and which he therefore appreciates far out of proportion to the time and trouble it involves.

"Third, remember always to treat each customer as an individual, rather than as just a number in the meter book—show a *personal* interest in him and his problems.

"Fourth, in all your thousands of daily dealings with customers, keep firmly in mind the fact that your customers are and always will be interested in *their* problems rather than yours.

"Fifth, work constantly to identify your own interests, and therefore those of the Company you represent, with the best interests of the people and communities you serve. True identification of this kind can only be accomplished by *deeds,* rather than by mere words. And there's no better way to accomplish it than by taking an active personal

(Continued on page 70)

AT PG&E'S BODEGA BAY PLANT, pressure suppression will not be the only area of technical advance over previous boiling water reactor designs. The proposed $61-million, 325-megawatt project, according to GE designers will be "simpler, more compact, more economical and more flexible" than earlier reactor designs. Technical advances to be incorporated will encompass such things as improvements of calculation techniques and criteria, development of improved instrumentation systems, and development of high-performance internal steam separators.

THORIUM-URANIUM FUEL CORE has been taken to criticality for the first time in tests by Babcock & Wilcox at the company's Lynchburg, Va., laboratory facilities. In an announcement last month B & W noted that the fuel charge was made of 3-million pellets, that the test required the use of 10,000 gallons of de-ionized water in the tank holding the core for the ConEdison Indian Point reactor. (Meanwhile, AEC Hearing Examiner J. D. Bond approved the ConEd reactor, prior to ruling on operating license.)

SELF-SUFFICIENT THORIUM SYSTEM may be a possibility in some reactor systems with "very excellent neutron economy," once an initial inventory of fissionable material is provided for the reactor and its associated processing pipes, according to the AEC's U. M. Staebler. In a recent paper (delivered for the 6th Nuclear Congress in Rome), he noted that, if breeding can be achieved, it may also be possible to supply some of the initial inventory requirements for new reactors from excess breed material.

ROLES OF UTILITY ENGINEERS assigned to atomic power projects by participating companies are varied numerous and expanding. From the Enrico Fermi plant in Monroe, Mich., comes a good example of the importance of such contributions to nuclear progress—the key part Toledo Edison's James E Seward played in steering the development team that produced the $700,000 transfer car for handling nuclear fuels and removing spent fuel from the fast breeder plant. Involved in completing what was dubbed "The Toledo Express" were many complex design problems, months of research and testing. The Toledo Edison engineer's responsibility was to weigh the value of ideas which filtered from his "brainstormers' " group—ideas which were vital to final concepts of the first-of-its-kind vehicle.

DESIGN BY CONSULTING ENGINEER—When the National Bureau of Standards recently retained Burns & Roe, Inc. to plan its new 10-megawatt heavy-water research reactor, it marked the first instance in the nuclear energy field that a consulting engineering firm has been given the task of designing a complete nuclear reactor facility, says the N. Y. company. Calling this "a step in the right direction," the firm's chief nuclear engineer, Dr. S. Baron, remarked: "It returns to the consultant the classic responsibility of designing the complete power generating station, with compatible equipment to produce power most efficiently. For some reason, nuclear power stations have drifted from this concept, leaving design of the reactor up to the manufacturer, and then having the rest of the plant built around it."

Beneath the sea surface, or in a remote land area, this portable, self-regulating atomic power plant (at left) could provide electricity for military, weather or communications stations. Capable of long-term, unattended operation, the "package" plant is under conceptual design and development at General Atomic's laboratory. Reactor design will utilize features incorporated in the company's TRIGA research reactors.

Europe's first major materials and engineering test reactor is this water-cooled 50-megawatt facility (at right) now operating at Mol, Belgium. One of the highest powered nuclear experimental facilities in the world, it is said to increase the nuclear materials testing capability of the Free World by almost 50-percent (with only the AEC facilities at the NRTS in Idaho comparable). Control room is at upper left, reactor access balconies on right.

WASHINGTON OUTLOOK

BY RALPH ELLIOTT
WASHINGTON EDITOR

Grass-Roots Uprising Needed To Curb Socialistic Programs

"The American people will never knowingly adopt socialism but, under the name of liberalism, they will adopt every fragment of the socialistic program until America will one day be a socialistic nation without knowing how it happened."

Those words were not a warning from some conservative quarter. They were quoted during a recent debate in the House of Representatives, and were said to have come several years ago from Norman Thomas, this country's foremost Socialist (in the open, at least) and six-time candidate for president on the Socialist ticket. For the past two or three months, each day of the New Frontier has brought fresh evidence of how accurately foretelling the Thomas statement could turn out to be.

President Kennedy began his term with a flurry of assurances tossed to the advocates of private enterprise. His aim, he said, was to cultivate close cooperation—indeed, a full-fledged alliance—with the business community. But what has been happening lately in Washington points toward just the opposite, and is generating an anti-business climate of disturbing proportions. So far the antagonism toward business has been stirred up, for the most part, by Kennedy lieutenants. The President, however, has shown no inclination to check-rein or veto them.

Some of the most astute Washington observers are saying flatly that the Administration is becoming hopelessly tangled up in its something-for-everybody programs, and is floundering in a political fog, with no consistency in purpose or policy regarding foreign or domestic affairs. They see the once aggressive, politically crafty Kennedy as having been slowed down and somewhat confused after six months of jousting with the enormity and complexity of the job he undertook to do as President. His recent willingness to let others, of various political idealogies, in the Administration carry the ball with little or no White House interference, has added to the fuzziness of just what is national policy.

Although the hodgepodge of federal programs now in various stages of development has created an atmosphere of general confusion in Washington, one element of consistency on the Administration's part stands out: just about every program offered as a solution to the Nation's problems spells further expansion of the Federal Government and a spread of federal control over the affairs of individuals as well as business. There is even a belief in some responsible circles that a few Administration people are deliberately attempting to create situations that will eventually necessitate the government's assuming a far broader role in running the economy.

The most striking example of downright socialistic objectives is to be found in the New Frontier's electric power policy.

Two key developments in this area have brought into clear focus the Administration's true attitude toward private enterprise. The first was its proposal for the needless spending of $95 million for the production and commercial sale of subsidized steam generated power at the Hanford atomic energy plant. (The proposal, defeated in the House but passed in the Senate, went to committee for a possible compromise.) The prime objective of this scheme is to establish a steam plant precedent outside the TVA area. But it has other far-reaching implications in that it would put AEC in business as still another federal power agency; move the government closer toward a full utility responsibility in the Northwest; and beef up the pitch for federal construction of a BPA-California intertie.

New Frontiersman---Same Old Act!

The second development was REA Administrator Norman Clapp's proclamation of his "third criterion" for making generation and transmission loans to co-ops: where they are "necessary to protect the security and effectiveness of REA-financed systems." Or, as the Administrator puts it, "to guarantee the cooperative device a permanent place in the American power industry." Also, the criterion can easily be made the vehicle for vastly increasing co-op competition with private industry for non-farm loads, in contravention of the intent of the REA Act.

Referring last month to his recent approval of a $60-million G&T loan to the Hoosier co-op federation in Indiana, Clapp said: "There will be more such loans ahead."

The only effective remedy for what is taking place in Washington would be a grass-roots uprising of sufficient proportions to cleanse the Congress of legislators who are willing to sacrifice political integrity and traditional American principles for the paltry short-terms gains of political expediency. There has never been a more crucial need for application of the safety factor provided by the separation of powers provision of the Constitution. True, there will always be room for some mischief at the executive department level. But this is insignificant when compared with the tremendous powers available to Congress to grant or withhold funds to finance national programs, and to establish national policy by unequivocal law. The latter could bring much-needed order to the widening area of confusion created by the mishmash of executive directives which, all too often, are allowed to become law via the back door.

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A Subsidiary of
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Write for a free Catalog outlining types and sizes of test switches, test blocks, reactiformers, enclosures and meter socket equipment.

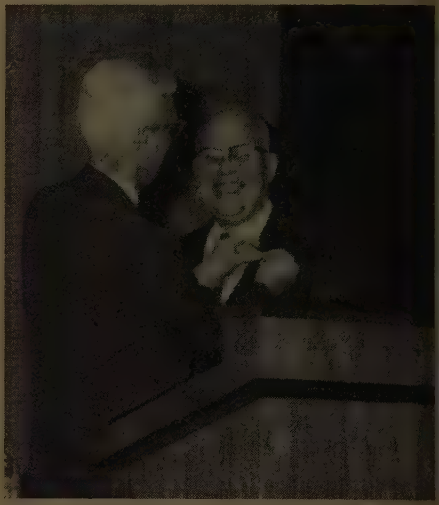
Du Mont Calls For Government-Supported TV Network At AIEE Summer General Meeting

A fourth television network supported by the government is urgently needed to solve the programming ills and excesses prevalent in commercial networks and individual stations. This was the message of Dr. Allen B. Du Mont, television pioneer and founder of Allen B. Du Mont Laboratories, in addressing 900 members of the American Institute of Electrical Engineers at their annual Summer General Meeting held at Cornell University June 19-23.

Dr. Du Mont said that the U. S. Government is the only possible sponsor for programming of a non-commercial, intellectual and informative type. "We are spending over 40 billion dollars for defense, space projects, and maintenance of our arms establishment." I plead for some millions and for some men with guts to bring culture and information to the television screen, he declared.

The Annual Report was delivered by AIEE President, Clarence H. Linder, vice president, General Electric Co., at the Annual Meeting. In summarizing Institute activities during his term of office, Mr. Linder stressed "creative management of technology" as a basic guiding concept. Citing specific steps of progress in the period, Linder said: "The Board of Directors has authorized the appointment of a Committee of Action, reporting directly to the President, whose function will be to identify and enunciate clear objectives for the Institute in these times of changing and expanding technology. This Committee will be composed of prominent members of the Institute and its work will stress the management of technology to provide in fact a plan for continuity of the Institute's contributions in the total technical spectrum.

Dr. Allen B. Du Mont (left), television pioneer and founder of Allen B. Du Mont Laboratories, accepts honorary membership in AIEE from AIEE President, C. H. Linder, General Electric Co.

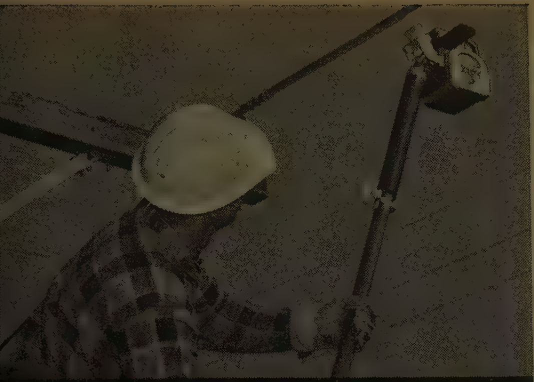


New AIEE President, Warren H. Chase (right), Ohio Bell Telephone Co., receives pin from outgoing President C. H. Linder, General Electric Co.

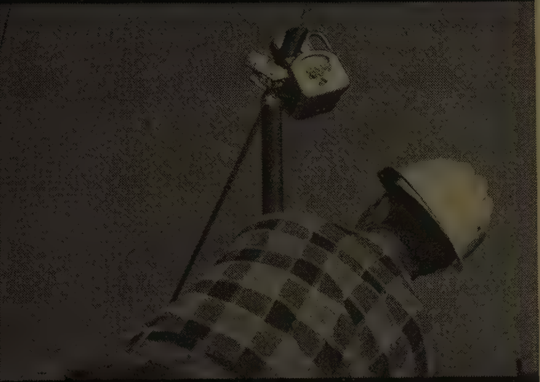
"A Task Force has been established to study the systematic and long-range development and deployment of Institute officers and committee membership, in order to provide the Institute with ample supplies of leadership manpower," he added.

J. J. Mikos, S&C Electric Co., and V. P. Rader, American Electric Power Service Corp., described the results of a series of field tests of a switch in an operating power system to obtain information on de-energizing capacitors under various conditions. They proposed the adoption of a standardized term—

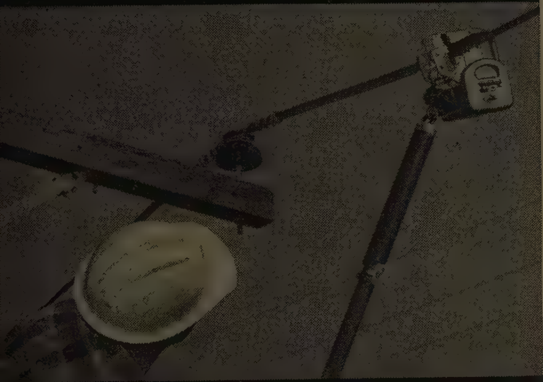
(Continued on page 71)



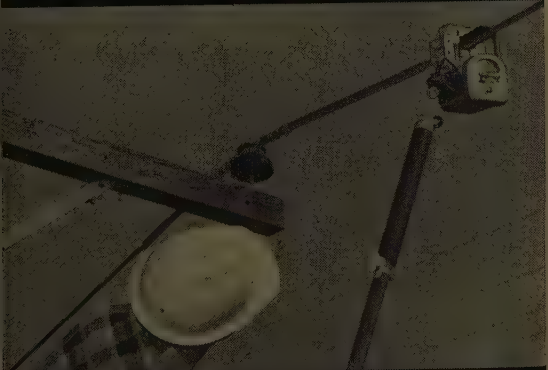
Step I — Installing PRIMAX-I-METER on conductor by means of one hot stick.



Step II — PRIMAX-I-METER positioned on conductor.



Step III — Tightening of eyebolt closes split-core transformer.

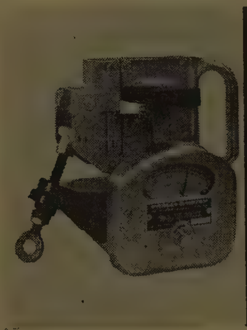


Step IV — PRIMAX-I-METER installation now complete, hot stick is removed from instrument fitting. The maximum demand hand of the PRIMAX-I-METER can be reset to zero by means of this same hot stick.

WHERE'S THE *Second Stick?*

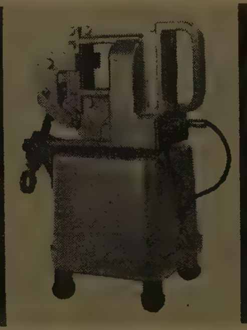
You don't need it. HD Electric instruments are all equipped with a *single* hot line fitting that nests into "Grip-All" heads of hot line sticks firmly and securely. Skillful engineering and manufacturing ingenuity developed this major improvement to save installation time, insure safer hook-up conditions and conserve manpower. When using HD instruments on primary circuits, no more time is required than during manual installation on safe secondary circuits.

Other quality benefits built into HD instruments are their lightweight portability, accuracy, combination of uses, large easier-to-read scale plates and over 28 years of continuous specialization and experience in serving the electrical power industries. Write today for a complete set of our latest technical data and price sheets.



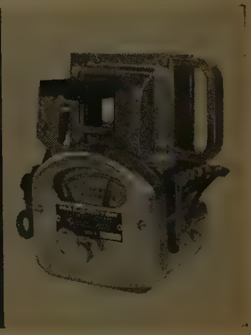
PRIMAX-I-METER

Measures and registers maximum current from 0 to 45 amperes. Split-core design permits measurement without interruption of service.



INVERTED SCALE MAX-I-METER

A unique instrument with meter element housing facing down, for more flexibility in field application and scale reading from ground level.



HOT LINE MAX-I-METER

Registers and records in 30 minutes the maximum amperage flowing through conductor. An instrument with hot line combination of instantaneous and maximum demand scale is also available.

BULLETINS SENT ON REQUEST

HD ELECTRIC COMPANY
Electrical Testing Equipment

P. O. Box 633 • 760 Osterman Ave. • Deerfield, Illinois

Power Pruner Cuts Two-Inch Branches

A complete line of power pruners to cut back trees near utility lines is now being marketed by the A. B. Chance Company. The tools can be powered by compressed air, CO_2, dry nitrogen or from a truck or insulated bucket hydraulic system. The blades are actuated by merely pressing a trigger on the tool handle. The pruner, shown in the photo, will cut live or dead branches up to two inches in diameter.

Ka-Mo Announces Large-Diameter Gasoline Boring Machine

The Ka-Mo G-160, a gasoline powered horizontal boring unit capable, the company says, of boring 36-in. diameter holes, has been announced by the Kwik-Mix Co., a division of Koehring Co.

The new machine consists of a 52-hp air-cooled gasoline engine, hook rollers and engine base, three-speed transmission and gear reduction with clutch, 9 gpm hydraulic pump powering the feed mechanism; leveling outriggers, track and connecting plates.

Ratings for the G-160 range, according to the company, from 150 feet of 36-in. diameter hole to 200 feet of 12-in. diameter, both maximum calculations for drilling with casing.

New Ultraminiature Transistor Shrinks Computer Basic Circuitry

An ultraminiature experimental transistor, so small, the company says, that as many as 20,000 can fit on a postage stamp, has been announced by Radio Corporation of America. The transistor is made b depositing thin films by evaporation on an insulatin base and is capable of shrinking the basic circuitr of a computer to the size of a book page, according t the company. The basic circuitry of present-da computers ranges in size from the equivalent of large hat box to a walk-in clothes closet.

Electric Power Connector Standards Under Revision By NEMA

By EUGENE GORIN,*
Chief Engineer,
Memco Engineering and
Manufacturing Co.

To assist technical personnel engaged in the selection of power connectors, the Technical Committee of the NEMA Electric Power Connector Group is *developing* a common language for the Industry through the use of specific nomenclature and through the development of standards that may be used as an everyday reliable reference and guide. These NEMA Standards establish clear definitions and classifications; recommend engineering practices, test methods, and performance requirements, and basic dimensions for overall designs.

Considerable progress with these new NEMA Standards has already been made and reported in recent published supplements to NEMA Publication SG-1-1958, which include new classifications of power connectors (for copper or aluminum—SG1-4.04) based on number and sizes of clamping bolts. Also included is the accompanying table of recommended torque values which will be of great assistance to those interested in the practical application of electric power connectors.

For other details, refer to recent attached supplements to this publication obtainable from NEMA 155 E. 44th Street, New York 17, N. Y.

* Eugene Gorin is Chairman of the NEMA Electric Power Connector Group Technical Committee.

RECOMMENDED TORQUE VALUES

Class of Connector	Diameter of bolts, Inches	Nominal Torque Ft/lb	Nominal Values In/lb	
CF1	⅜	20	240	For Copper
CF2	½	40	480	For Copper
CR2	⅝	55	660	For Copper
AR	½L	25	300	For Aluminum
AF	⅝L	40	480	For Aluminum

L—Lubricated
NEMA Suggested Standard For Future Design 7-16-1958, rev. 3-11-1957.

New Chance Engineering Research Center In Operation . . . .

The A. B. Chance Company reports that their new F. Gano Chance Engineering Research Center located near the company's general office in Centralia, Mo., is now in full operation. The Center contains 32,000-sq ft of office and laboratory space in the two buildings on an 18-acre tract.

C. H. LeVee, Vice President, Engineering, is in charge of the new facility and has extended an invitation to utility personnel to visit the new center and observe the operation and testing equipment.

The Center's High Voltage Laboratory contains a 2,400,000-v impulse generator and 60-cycle dielectric test transformers with a 1,000,000-v capacity.

The Short Circuit Laboratory has 762,000-kva generator and a test substation with two single-phase, 200,000-kva transformers.

Other facilities in the center include mechanical, plastics, heat run, environmental, fuse link and electrical measurement laboratories. The latter area includes calibration equipment to insure the accuracy of all testing instruments.

The facilities of this new research center will be made available to utilities, engineering colleges and other manufacturers serving the electrical industry, according to Chance.

The high-bay of this new F. Gano Chance Engineering Research Center contains the high-voltage laboratory which accommodates the 2,400,000-v impulse generator. The Center is located near the general offices of the Chance Co. in Centralia, Mo.

Kaufman Enterprises, Inc., one of the nation's newest major designers and fabricators of transmission towers and switchyard structures, has recently completed expansion in personnel and machinery to meet a steady increase in production volume since beginning production early this year.

Formation of a new corporation, **Rochester Instrument Systems, Inc.**, Rochester, N. Y., was announced recently by its president, **Donald D. Welt.** The company will design and manufacture electronic instruments and systems for the process control industry, with prime emphasis on nuclear reactor instrumentation.

Alcoa of Australia Proprietary Ltd., was announced recently as the newest overseas venture of **Aluminum Company of America.** The new concern, to be owned 51 percent by **Alcoa** and 49 percent by a group of leading Australian mining companies, plans to begin construction by the end of this year, **Alcoa** announced.

Canadian Allis-Chalmers has announced the transfer of all electrical production from its St. Thomas, Ontario, plant to the plant at Lachine, Quebec, effective July 28, 1961.

Mortimor S. Gordon, President of **Continental Copper & Steel Industries, Inc.** and James M. Gilbert, President of **Silvray Lighting, Inc.**, have announced that a tentative agreement to merge the two companies has been reached.

PENGO AUGERS

Save you money 4 ways

PENGO HEAVY-DUTY Twin Helix Augers—14" through 96" hole diam.

1 **BORE FASTER**...put real "teeth" in earth drilling, save wear and tear on your diggers.

2 **STAY ON THE JOB LONGER** ...all wearing parts replaceable in the field; no down-time for shop welding.

3 **COST FAR LESS TO MAINTAIN** ...reversible teeth cost only 90¢ each, pilot bit only $8.00. Parts interchangeable on all PENGO augers you are using...less inventory!

4 **A SIZE AND TYPE FOR EVERY BORING JOB**...Augers and boring heads (for welding to your present auger) available for every make of machine from post hole diggers to largest heavy-duty earth drills. Write for catalog.

PENGO Prope®

—the most satisfactory construction rope available today!

- ✱ GREAT STRENGTH (8,200 lbs. for ¾" diameter)
- ✱ LIGHT WEIGHT (11 lbs. per 100 ft. ¾" diameter)
- ✱ HANDLES AND SPLICES LIKE MANILA in any climate or weather
- ✱ WATERPROOF (even salt water); can't mildew or rot. Excellent dielectric properties.

PENGO-Prope is a synthetic rope of special construction available in all popular diameters from 3/16" to 2"; regular construction in sizes smaller than 3/16". Write for specifications, prices.

17

PETERSEN ENGINEERING COMPANY, INC.
Santa Clara, California
Axminster 6-7712

SALES BRIEFS

Appointment of **Gordon D. Thorpe** as Central Area Sales Supervisor is announced by Jess C. Little, Manager, Electrical Products Division, **The Fanner Manufacturing Company**. Thorpe will provide liaison and service between factory and electric utilities through **Fanner Manufacturer's** Representatives in 13 midwestern states.

J. C. Maeder was appointed Western District Manager, **National Electric Division, H. K. Porter Co., Inc.** He will be responsible for the sales activities of seven branch offices serving thirteen Western states with headquarters at Los Angeles.

Through a recent **H. K. Porter Co.** inter-divisional arrangement, the **Delta-Star Electric Division** was designated as a sales agency for control and power cable manufactured by the National Electric Division. As a result of this arrangement, both cable and cable-accessory items can now be obtained through the national network of **Delta-Star** district offices.

Appointment of **Paul L. Schmitz** as sales manager of The Alite Division and **Walter J. Tarnacki** as manager of the Alite high alumina ceramic manufacturing operations is announced by James M. W. Chamberlain, president of **The U. S. Stoneware Co.**

C. F. Burnap and **P. R. Keep** have been appointed sales directors of General Products and Power Systems, respectively, it was announced by **Atomics International**, a division of **North American Aviation, Inc.**

Floyd E. Welch and Associates, San Francisco, have been appointed district representatives by **Blaw-Knox Company**, Copes-Vulcan Division, Erie, Pa.

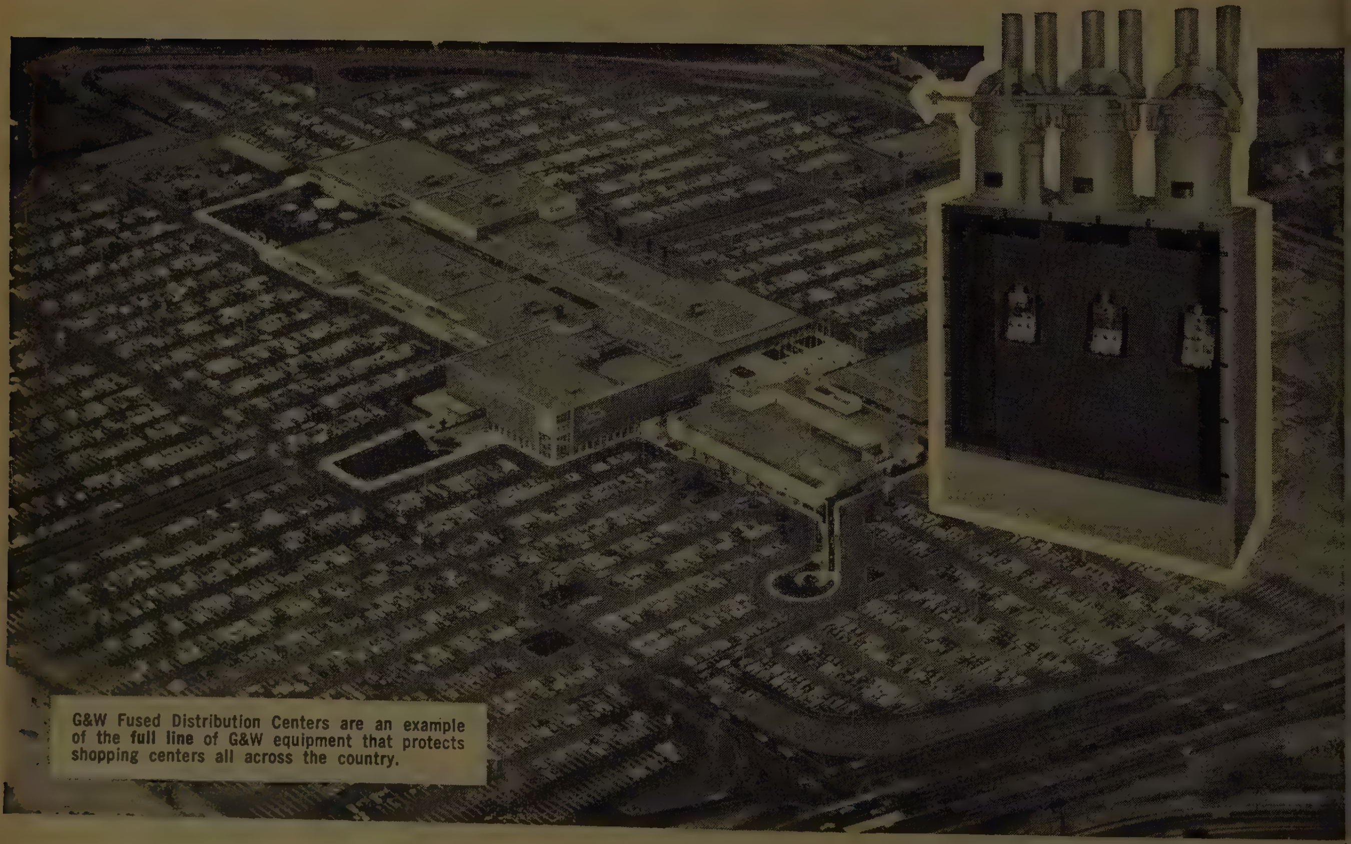
Ralph J. Teeple has been appointed sales manager of **Page Steel and Wire Division** according to an announcement by Henry Ervin, vice-president and director of sales of **American Chain & Cable Co., Inc.**

Phelps Dodge Copper Products Corp. announces the appointment of **Avery H. Gould** to District Manager, Utility Sales for the New York territory.

Three managers have been named to handle key areas of advertising and public relations for **The Babcock & Wilcox Co. Edward M. McClure** has been named manager of equipment advertising and sales promotion. **James H. McCormick** has been appointed manager of corporate advertising and publications. **James O. Trudeau** has been promoted to manager of public relations services. The three appointees will retain headquarters in **B&W's** New York offices as members of the Staff division.

Appointments of **Andrew Wassell** as manager, utility sales, Charlotte district; **Thomas L. Dineen** as manager of the Cleveland district; **Henry M. Brundage** as manager of the Chattanooga district; and **Joseph Bronaugh** as manager, utility sales, Baltimore district; have been announced by **Allis-Chalmers.**

Protect the MAIN LINE with



G&W Fused Distribution Centers are an example of the full line of G&W equipment that protects shopping centers all across the country.

lew Chopper

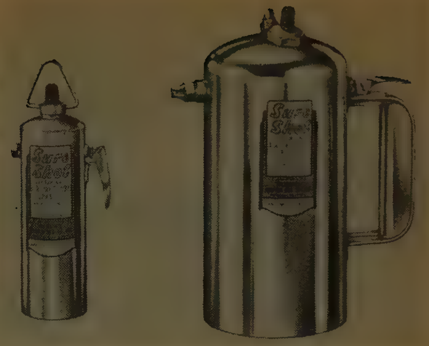
New Chopper SS1012 by **Felco** s designed for use with tractors of 30 HP and more. A ten-foot swath an be cut in vegetation up to eight-nches in diameter, the company ays. Growth is cut, fractured and artially buried to speed decom-osition. Twelve high-carbon steel, brasive-resistant cutting edges are eversible. When filled with water, he SS1012 weighs approximately 5,000 lbs, concentrating over 200 bs on each inch of blade, according o the company.

Circle item #1 on reply card

'Flasher-Light' Barricades

"Horse"-type barricades with the new Blink-N-Beacon transistorized warning flasher lights have just been introduced by the **Electronics Division of Barler, Inc.** Because of their transistorized circuit, they have a minimum battery life of 1,500 hours, but in actual use, average much longer, the company says. Operating on standard six-v dry cell batteries, the new barricade flashers can be seen, it is said, for one-half mile in either direction in the most extreme weather conditions—snow, sleet, rain, fog—and much longer distances under normal conditions. Flashing rate is a uniform 50 to 60 per minute, or can be supplied at any other flashing rate prescribed by local, state or federal regulatory agencies. The flashers are equipped with choice of red or amber puncture-resistant plastic lenses.

Circle item #2 on reply card



Air-Pressured Sprayers

Utility maintenance operations, it is said, are faster and more efficient with air-pressured Sure Shot portable sprayers, by **Milwaukee Sprayer Mfg. Co.** The sprayers dispense light liquids in a jet stream for bulls-eye accuracy, or in a fine mist spray for wide area coverage. Sure Shot pressure sprayers are useful for applying detergent for speedier street lamp cleaning, weed killers at substations, creosote for pole butts, and lubricants for hard-to-reach places on turbines and other machinery, the company says.

Circle item #3 on reply card

G&W Fused Distribution Centers

- **Ever had trouble with a branch 4-kv primary tap that blew the whole main feed?**
- **Did you ever want to work on a tap and find you had to shut down the whole system before the tap could be isolated and safe to handle?**

G&W Fused Primary Distribution Centers solve these problems completely by providing a fused, three-phase or single-phase disconnecting device that can be operated under load for any tap off the main primary supply. Ideal for protecting primary loops or radial systems operating at voltages up to 15 kv, the G&W Centers can be used indoors or outdoors; are easy to install; and provide a disconnect for safety.

G&W Fused Distribution Centers have proved themselves time and again in applications at shopping plazas, industrial plants, and institutions with one or more buildings but these are only a few of the many places where they can be effective.

Distribution Centers are flexible. One or more circuits can be brought into a center to supply a fused load, or a single supply circuit can be used to feed a fused bus from which multiple load circuits are taken. The main primary feed can terminate in the box or run through as required. Insulated bus pads are provided for each phase leg with no limitation on the number of taps. The box can be bolted onto a concrete pad or embedded four to six inches into the concrete when the pad is poured.

Distribution Centers are gasketed to provide a weatherproof unit that fully meets NEMA Type 3 standards for weatherproof construction. Watertight, submersible construction is also available.

G&W

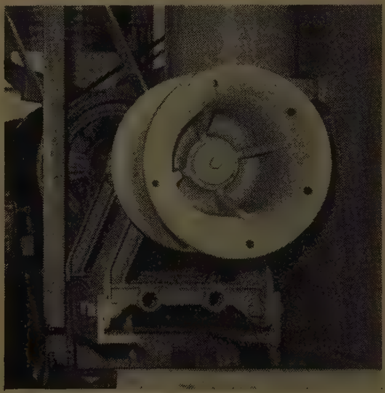
G&W ELECTRIC SPECIALTY COMPANY
3504 WEST 127TH STREET • BLUE ISLAND, ILLINOIS
Canadian Mfr. • Powerlite Devices, Ltd. • Toronto, Montreal & Vancouver

superior quality standards—inspired specialized design

C61-2

TULSA®

This International R-190 truck uses a model 34 Tulsa Winch operating with a hydraulic boom. The truck is one of the 2,850 vehicles used by the Southern California Edison Company to service more than 20,000 square miles in the Southern California area.



strength & stamina that spell savings

There's more room for pay load because a Tulsa Winch is compactly designed. This winch packs a terrific pull even though weight has been trimmed to the bone. More shock load is absorbed, and more operating efficiency is delivered by Tulsa's specially designed worm and gear. You have less engine wear and lower fuel bills since you use less horsepower to move a given load. Longer life for cable or wire is provided by a larger size and machined drum barrel.

Tulsa's easily installed front mounted winches assure better weight distribution and steering for the vehicle — and safer off-highway operation — because there's a minimum of overhang.

WRITE for special Public Utility bulletin CUV-58.

TULSA PRODUCTS DIVISION

VICKERS INCORPORATED, DIVISION OF SPERRY RAND CORPORATION

731 EAST 1ST ST. TULSA, OKLAHOMA

E-403

Pocket Size Transceiver

Now going into production is a full one-watt, all-transistorized, portable transceiver, by **Osborne Electronic Sales Corp.** This compact, lightweight (28 oz), hand-held unit, with ten times the power of current models, fills a need for increased range requirements, the company says. In addition to noise-quieting features, it has a rechargeable battery pack with, it is said, up to eighteen hours of useable life before recharging. Osborne also produces a battery recharger unit.

Circle item #4 on reply card

Explosion-Proof Lighting

A line of explosion-proof lighting fixtures for extremely hazardous areas has been developed by **Killark Electric Manufacturing Co.** These Series "E" fixtures are available in pendent, ceiling, bracket and concrete mounting types, with openings for ½ inch, ¾ inch, and 1 inch conduit, and with various types of steel porcelain enamel reflectors accommodating 150-watt nd 200-watt lamp sizes. All cast arts are copper-free aluminum.

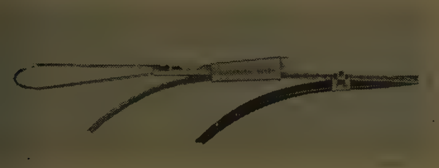
Circle item #5 on reply card

Compact Fault Finder

New fault finder developed by **Electric Radiant Heat, Inc.**, locates breaks quickly and accurately in electric heating cable imbedded in finished dry wall or plastered ceilings, according to the company. The unit can also be used to spot plastered-over outlets, junction boxes, and wiring within walls, the company says.

This compact, transistorized, battery-operated unit consists of a transmitter signal pack, a receiver pick-up pack with telescoping antenna probe, and earphone headset. Each of the two packs is about the size of a king-size cigarette package ($3\frac{9}{16}$ inches x 2 inches x $1\frac{5}{16}$ inches).

Circle item #6 on reply card



All-Aluminum Wedge Clamp

An all-aluminum wedge clamp for aluminum neutral messengers at service dead-ends has been developed by **Jasper Blackburn Corporation.** Aluminum-to-aluminum contact between conductor and clamp eliminates bi-metallic galvanic corrosion, and is said to add substantially to the clamp's service life. Construction is heavy-gauge, high-strength aluminum alloy.

Circle item #7 on reply card

NEW

SUPER SAFE ROPE

FIELD TEST PROVEN TO HAVE LOWEST ELECTRICAL CONDUCTIVITY!

Berkley

GLADIATOR "MADE STRONGER TO LAST LONGER" PAT. PENDING TRADEMARK

POLYPROPYLENE ROPE AND POLYETHYLENE ROPE

Berkley Gladiator Polypropylene rope and Polyethylene rope — from 3/16 to 2" in diameter — is the ideal rope for hand lines, pulling transmission cables, for block tackle, etc. This new rope sheds water and is completely rot-resistant — thus giving it a very low ELECTRICAL CONDUCTIVITY. Extra easy to handle because it is light in weight, yet 50% stronger than manila. It can be easily spliced and carries a stronger knot strength than manila. Berkley's new safe-to-handle Gladiator rope will do a better job for you.

Please rush me sample, costs and fact sheets on Polypropylene.

NAME__________ COMPANY__________

ADDRESS__________

CITY__________ STATE__________

☐ Check here if you want a Berkley representative to call on you.

How much footage of rope do you purchase a year?

BERKLEY & COMPANY - SPIRIT LAKE, IOWA

NEW TYPE SR CROSSARM ROLLERS

SPEEDILY AVAILABLE
LOW IN COST
ALWAYS DEPENDABLE

No. 9811
Nail or bolt to crossarm

No. 9812
Clamp on crossarm or suspend from insulator string

No. 9821
For turning corners

No. 9822
For going up and down hill

Each of the four designs is available with easily interchangeable cast iron or aluminum rollers. Three types of bearings. Plain bore or bronze bushed rollers 3¾" diameter. Ball bearing rollers 4½" diameter.

NEW CATALOG on complete line of S&R Conductor Stringing Equipment sent on request.

SHERMAN & REILLY, INC.
ENGINEERS AND MANUFACTURERS
1ST & BROAD STREETS - CHATTANOOGA 2, TENNESSEE
TELEPHONE AMherst 7-1273 TWX CT-7036

INTRODUCING THE NEW
DRYDEN-EAST
HOTEL
39th St., East of Lexington Ave.
NEW YORK

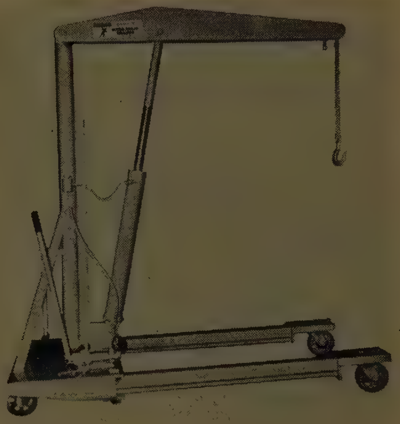
Salon-size rooms • Terraces • New appointments, newly decorated • New 21" color TV • FM radio • New controlled air conditioning • New extension phones in bathroom • New private cocktail bar • Choice East Side, midtown area • A new concept of service. Prompt, pleasant, unobtrusive.

Single $15 to $22 Suites to $60
Special rates by the month or lease

Robert Sarason, General Manager
ORegon 9-3900
Teletype NY 1-4295

Two-Ton Crane

Ruger Equipment, Inc. has just announced the design and production of a new series of two-ton capacity mobile multi-purpose floor, truck and pedestal mounted hydraulic cranes. Designated the HP-2 Series, the company says the new models are lighter, stronger and more maneuverable than any previous models. These versatile cranes, it is said, permit one man to lift, transport and position loads in a single operation.



Circle item #8 on reply card

Capacitance Bridges

New high-voltage capacitance bridges, by **General Electric**, are available in mobile or stationary consoles at up to 500 kv or any higher voltage which may be desired, the company says. They feature an accuracy of capacitance measurement of 0.2 percent and dissipation factor measurement of 0.01 percent, says the company.

The new line is designed to measure capacitance, dielectric losses and dissipation factor of insulation.

Circle item #9 on reply card

Support: SADDLE CLAMP and ARMOR RODS.
Conductor Sample: 1272 MCM 54/19 ACSR

TENSION (lbs.)	% RBS	Freq. (cps)	Amp. (in.)	Cycles (x 10⁶)	STRAND BREAKAGE
10,000	22.3	26	.630	176.6	17 WIRES BROKEN

176,600,000 CYCLES
1,887 TEST HOURS
AT 22.3% TENSION

Brarmann

Edward F. Brarmann, Jr., president of the New Jersey Federation of Shade Tree Commissions, has been appointed supervisor of forestry for Jersey Central-New Jersey Power & Light Companies. He will be responsible for the utilities' extensive tree rimming program on which the ompanies spend $1-million a year, nd will be in charge of the companies' chemical program for transmission right-of-way maintenance. He is a past president of the New Jersey Society of Certified Tree Experts, and a director of the Naional Shade Tree conference.

* * *

Named acting manager of the heat transfer department for the steam division of Westinghouse Electric Corp. is **William Rudloff**, former manager of manufacturing. He succeeds **David Fulton** who has been appointed to a term assignment as general manager, heavy apparatus, in Canadian Westinghouse Company, Ltd. Mr. Rudloff joined Westinghouse and the steam division in 1946. After serving in various manufacturing capacities, he was named foreman and, later, general foreman. In 1955 he was appointed a divisional staff supervisor in the equipment and methods department, and the following year became manager of manufacturing for heat transfer products.

* * *

Gabriel Kron, consulting engineer with General Electric Company's general engineering laboratory, has been awarded an honorary doctor of science degree by the University of Nottingham, at Nottingham, England. A mathematician, electrical engineer and physicist, Mr. Kron is the only American to receive such a degree from Nottingham, say University officials.

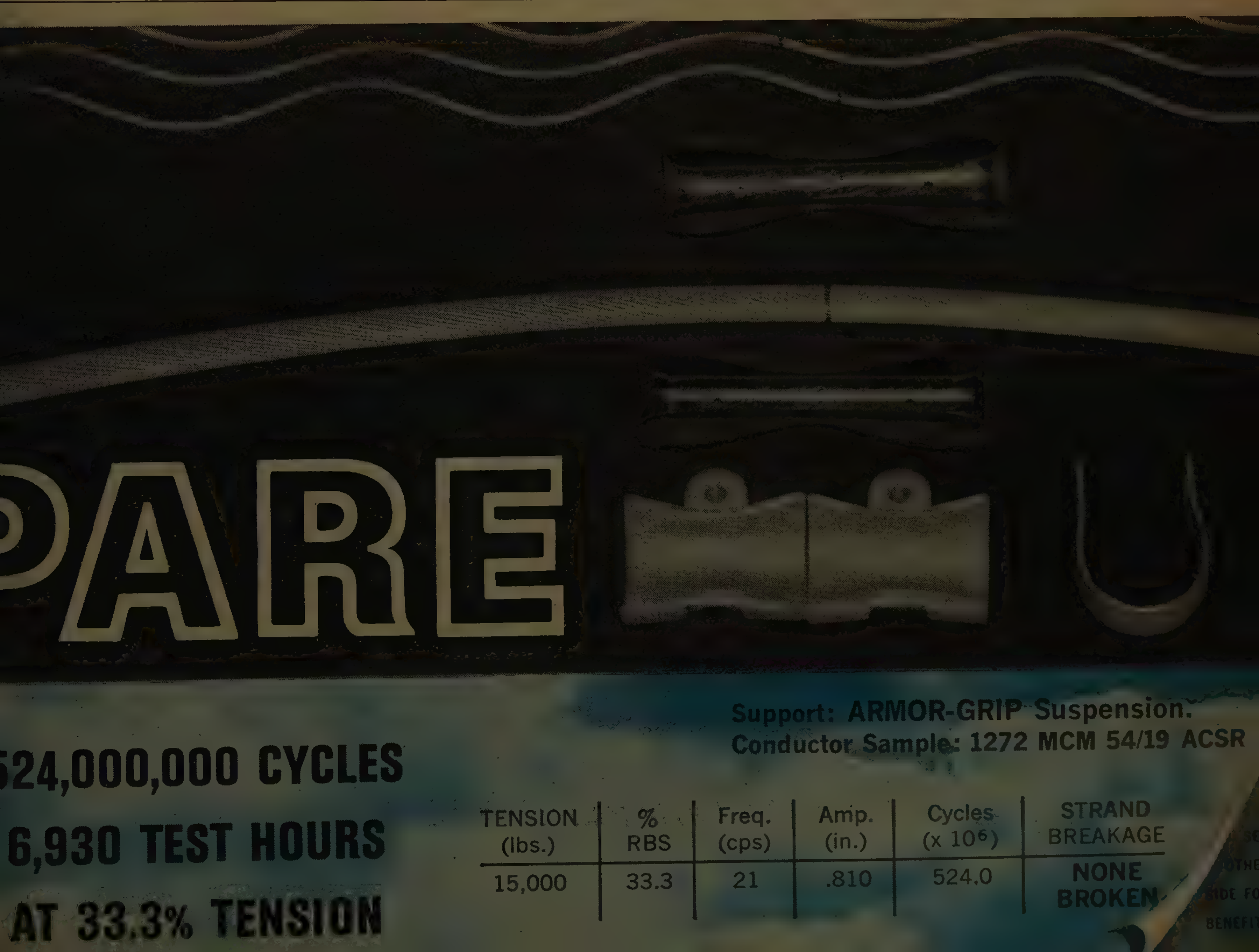
Mr. Kron's methods of solving complex problems by a mathematical approach have attracted worldwide attention. His methods were inspired by his interest in atomic physics and developed from his acquaintance with Einstein's theory of relativity. They are referred to as "diakoptics," from Greek words meaning to "tear asunder."

* * *

With the recent merger of the California Oregon Power Company into Pacific Power & Light Company, it has been announced that **A. S. Cummins**, former president of California Oregon, and **Glenn L. Jackson**, former vice president of California Oregon, have become vice chairmen of the board of Pacific Power & Light, the surviving company.

* * *

Dean H. Mitchell, president and chief executive officer of Northern Indiana Public Service Co., was given the additional title of chairman by the company's board of directors. **Carl D. Rees**, formerly vice-president of general operations, is first vice-president.



Support: ARMOR-GRIP Suspension.
Conductor Sample: 1272 MCM 54/19 ACSR

524,000,000 CYCLES
6,930 TEST HOURS
AT 33.3% TENSION

TENSION (lbs.)	% RBS	Freq. (cps)	Amp. (in.)	Cycles (x 10^6)	STRAND BREAKAGE
15,000	33.3	21	.810	524.0	NONE BROKEN

Elmer P. Bachtell, Jr., formerly manager of Industrial Power Sales, has been appointed manager of market research for Potomac Edison System.

* * *

Now manager of Kentucky Power Co.'s new Big Sandy plant is **Ronald Marshall,** former assistant manager of Ohio Power Co.'s Muskingum River station. He is succeeded there by **J. A. Moore.**

* * *

Iowa Public Service Company announces the appointment of four new directors and three new officers. The directors are **Thomas C. Grindberg, Duane S. Kidder, Gust Olson, Jr.,** and **Horace H. Sharrow.** New officers are **Mark Gardner, John Carlson,** and **Charles Dodd.**

* * *

George E. Carter, a veteran of 22 years as Oklahoma Gas and Electric Company's Poteau District manager, has moved to Durant, where he is now manager. He replaces **Poe Brown,** who has moved to Ardmore. Mr. Carter was replaced by **Amos Rowley,** former district superintendent.

* * *

L. M. Hatlestad, assistant secretary at Minnesota Power & Light Co., was elected vice president-administrative. In addition to his present responsibilities, he will take over supervision of the personnel, public information, safety and building service departments. **Sylvester Laskin,** range division manager at MP&L, has been promoted to the newly-created position of manager - division operations.

* * *

J. B. Thomas has been elected chairman at Texas Electric Service. He has been president and general manager since 1941. **Beeman Fisher** has been elected president, general manager, and chief executive.

* * *

Charles A. McKenna, chief accountant, property records, Wisconsin Public Service Corporation, advanced from vice-chairman to chairman of the Accounting Section of the Wisconsin Utilities Association. He succeeds **Henry F. Naybert. Iver G. Amundsen,** treasurer and assistant secretary of the Madison Gas and Electric Company, was named vice-chairman, succeeding McKenna.

* * *

B. H. Boatner, president of the Westinghouse Electric Supply Company, Pittsburgh, Pa. has been elected president of the National Association of Electrical Distributors. He will also serve as chairman of the Association's ten-man Executive Committee, and chairman of the Board of Governors.

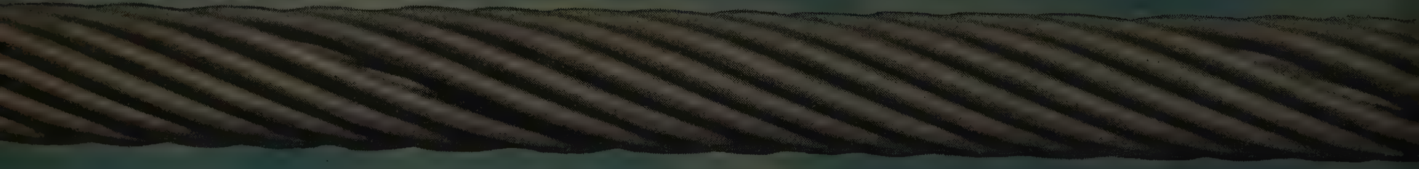
* * *

H. W. (Hugh) Cocklin, formerly superintendent at the Saguaro power plant, has been named superintendent of Arizona Public Service Company's new Four Corners Power Plant. He was employed by Public Service in 1949 at the company's Phoenix Power Plant. In 1953, he transferred to the then new Saguaro Plant near Tucson as results engineer, and became plant superintendent in 1959.

* * *

Elected Vice President of American Electric Power Service Corporation is **Harold R. Johnson,** director of public relations.

What's your line tension philosophy?...LOOSE?...''CABLE''?...''CODE''?...or TIGHT?



ARMOR-GRIP
TRADEMARK
Suspension let
TIGHTER TENSIONS SAFEL
opportunities to SUBSTANTIALL

You can look up to Preformed
TRADEMARK

PREFORMED LINE PRODUCTS COMPANY
5349 St. Clair Avenue • Cleveland 3, Ohio • UTah 1-4900 (216*)
600 Hansen Way • Palo Alto, California • DAvenport 4-2561 (415*)
*Long-Distance Direct-Dialing Area Code

Manufactured in accordance with, or for use under, one or more of the following U. S. Patent Numbers: 2,691,865; 2,722,393

MEN OF POWER BRIEFS

Glen W. Beeman, who has been uel agent and assistant director of urchases for Commonwealth Ediion Company, has been appointed lirector of purchases.

Wisconsin Public Service Corp. as announced the promotion of **V. H. Vande Hei** to division manger at Oshkosh. He replaces **E. S. chrank** who is retiring.

Joseph M. Duncan, formerly asistant general manager of Allis-Chalmers, Washington, D. C., has een appointed manager of the North Central Region with headuarters in Chicago.

Yuba Consolidated Industries, nc. has announced the appointnent of **William T. Egan** as general nanager of Yuba Manufacturing Division.

Joe Bussmann, Jr., service manager at Bussmann Manufacturing Company, was installed as presilent of the St. Louis Electrical Board of Trade.

Leslie S. Lynch, Jr. has been appointed executive engineer of the Utility Products Division of the Thomas & Betts Co.

Robert M. Gordon, associate director of the Stanford University computation center, has been named manager, training and education, for the commercial systems department of the Radio Corporation of America's electronic data processing division.

Bonneville Power Administrator, **Charles F. Luce** has announced the appointment of **Jack N. O'Neal** as Portland area manager succeeding **William A. Galbraith**, who moves to the power management division as power marketing specialist.

H. F. Beique, president and general manager of Quebec Power Co., has been elected president of the Canadian Electrical Association; **R. E. Tweeddale**, general manager of New Brunswick Electric Power Commission, was elected vice president along with **J. H. Steede**, vice president and chief engineer of British Columbia Electric Co.

Now vice president of engineering of Minneapolis-Honeywell's electronic data processing division is **John W. Anderson**.

FOUND!

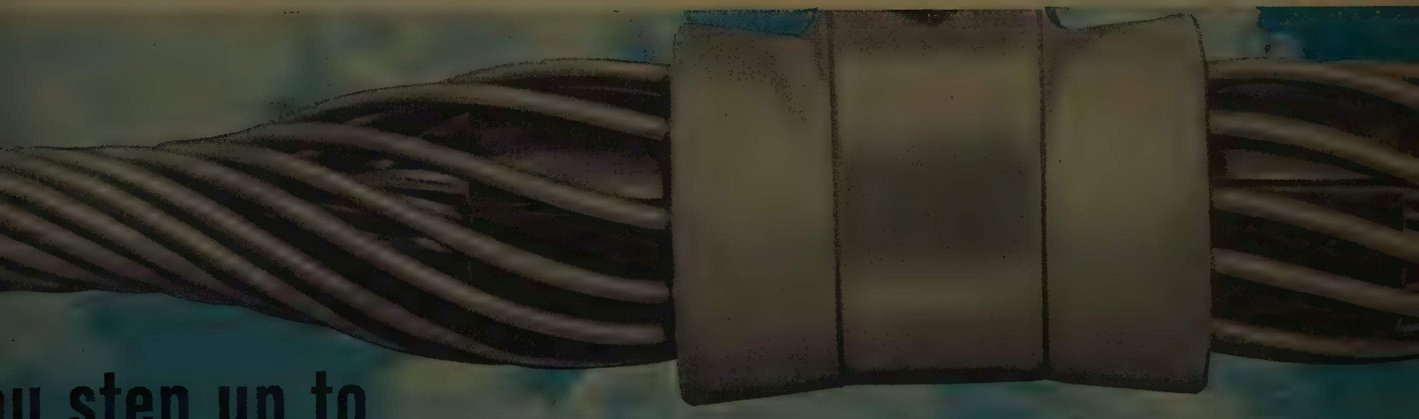
How To Keep Street Lights Burning

Take a simple, lightweight, compact photo control. Use Varistors in conjunction with the secondary lightning arrester.

RESULT: You eliminate the one biggest cause of photo control failure... transient voltage surges which are *below* the spark-over of lightning arresters.

That's LUMATROL MARK I...completely reliable! It withstands ALL transients up through the capability of the secondary arrester!

WRITE FOR BULLETIN 91a.
MICRO BALANCING, INC.
GARDEN CITY PARK, N.Y.
In Canada: J. R. KEARNEY CORP.
Box 270, Guelph, Ont.

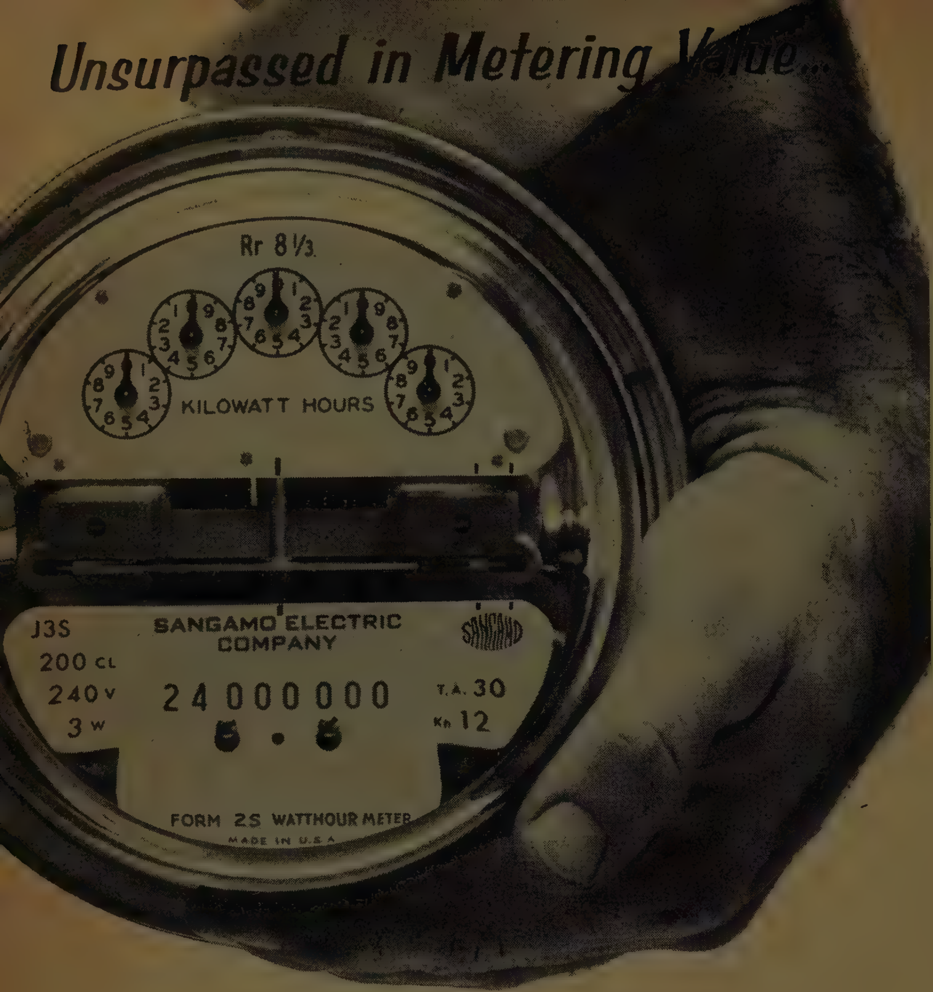


u step up to
and opens new
EDUCE LINE COSTS:

1. FEWER STRUCTURES
2. SHORTER STRUCTURES
3. NO VIBRATION DAMPERS
4. LESS MAINTENANCE AND INSPECTION
5. FASTER CONSTRUCTION

MORE FACTS?

Extensive technical information has been compiled to assist transmission line designers in the application of some of these cost reduction factors. Please indicate which of the following information you would like to receive:
☐ "AGS DATA FOLIO" ☐ "SAFE-T-CHART FOR PLANNED LINE ECONOMIES" ☐ "DETAILED TECHNICAL INFORMATION ON 'ARMOR-GRIP' SUSPENSION" ☐ "DEVELOPING AND TESTING SUSPENSION HARDWARE FOR TRANSMISSION SYSTEMS" ☐ "PLANNED LINE PROTECTION FOR EHV" ☐ "AGS UTILITY USERS' LIST" ☐ "BROKEN WIRE ASSUMPTIONS" (AIEE Committee Report)



Unique Magnetic System

free-floating...surge resistant...self-cleaning

The true magnetic flotation principle used in the Sangamo J3 Watthour Meter is unique! Two bonded cylindrical Alnico magnets with opposing magnetic fields float the disk freely.

The extra high coercive force Alnico material used in the magnetic system retains its strength even through repeated lightning and load surges, assuring accurate long-term registration.

Sangamo manufactures the magnets for precise magnetic and mechanical uniformity to assure performance stability in the J3 floating system. These magnets maintain a visible 1/16 inch cushion—magnetic particles are repelled from the gap . . . eliminating erratic light load registration.

This true magnetic floating system is designed for easy and positive control of disk position and endshake. It never requires costly maintenance or replacement . . . the floating system is guaranteed for the life of the meter.

true MAGNETIC flotation

J3

SANGAMO ELECTRIC COMPANY
SPRINGFIELD
ILLINOIS

PW61-3

PR Line—*From p. 51*

part in the major civic affairs of the community—educational, charitable, professional . . . yes, and political.

"*Sixth,* make the substantial extra effort required to talk with the customer in *his* language, rather than yours, or, you can bet that the customer will apply his own rule-of-thumb to the conversation—and come up with a translation which gives you none the best of it.

"We can be technically superior to everyone else. We can keep our books perfectly. We can do our jobs safely and efficiently. We can sell our services for less than the other fellow. We can have the biggest and most efficient generating units in existence. But—if the image we have built up in the customer's mind—from some discourtesy of misunderstanding—is one which has lost us his friendship and his respect, then we've lost the battle."

ELECTRIC UTILITY MANAGER

—Midwest Utility requires services of Operations Manager in newly created position. Consideration will be given to applicants with at least five years experience in top level operating responsibilities with a medium sized public or privately owned utility. Prefer EE/ME, aged 35 to 50, experienced in hydro and thermal generation. Starting salary $12-15,000 depending on experience. Future prospects attractive.

POWER PLANT OPERATORS

—Require Chief Engineer and Assistant Chief Engineer (Minimum 10 years experience) for operations assigned in new 20 MW oil fired plant located at Tripoli, Libya. Also three (3) Shift Foremen, one (1) Maintenance Foreman and one (1) Plant Technician. Six month contract with possible extension. Services required about 15 September 1961. Good working and living conditions. All replies treated in confidence. Address Gilbert Associates, Inc., Attn: R. W. Roughton, Box 1498, Reading, Pennsylvania.

GENERAL MANAGER

For Ipswich Municipal Electric Department. Salary depends upon qualifications. KWH sales about 25,000,000 from our generating plant to 3000 consumers. Write to Personnel Department, Town Hall, Ipswich, Massachusetts for application and more details.

NDUSTRY IN CONFERENCE . . .

(Continued from page 54)

circuit switcher" to describe a amily of interrupting devices in vhich the interrupter has certain haracteristics.

"What The Industrialist Should Know And Do When Arranging To Obtain Utility Power" was disussed by W. E. Marter, Duquesne ight Co. and A. Hauspurg, Amercan Electric Power Service Corp. Mr. Marter advised customers to vork out their relay protection chemes as early as possible and liscuss their plans with utility engineers before the protective equipment is ordered. Power interrupions and voltage dips are the major roubles that cause disturbances in ndustrial processes, Hauspurg said. "These troubles can usually be asily solved if engineering time is levoted to the review of this area luring the early stages of process lesign."

Utilities should keep careful records of outages to "assist the operating organizations in methods and approaches in the restoration of service which would lead to reducion in duration of interruption," urged J. J. Malone, J. E. Weed, T. E. Treweek and R. K. Moore, Pennsylvania Power & Light Co., and N. N. Smeloff. Total modernization cost averaged over the 1850 miles of main lines indicates that expenditures approximating 10% of present construction cost of a modern 12-kv line are required to modernize old lines to obtain performance expectations equivalent to new 12-kv lines, they said.

The Lamme Gold Medal is presented to Dr. John G. Trump (left), professor of electrical engineering at Massachusetts Institute of Technology, by AIEE President C. H. Linder, General Electric Co. The Lamme Medal is given annually to a member of AIEE who has shown meritorious achievement in the development of electrical apparatus and machinery.

First in Performance Values

SLOW DISK SPEED (10 rpm at rated load) minimizes the effect of current damping on high loads and inherently requires less compensation to produce a more uniform registration curve.

HIGHEST TORQUE (from 10 to 100% above other meters) produces better stability . . . more uniform registration . . . more accurate light load performance. Especially helpful when demand registers, cyclometer registers or contacts are used.

LOWEST LOSSES (up to 10% less than other meters). While this loss is only 10 kwhr per year on a single meter . . . multiply by the total number of meters in service. The answer will surprise you!

REFINED TEMPERATURE COMPENSATION is an important element in meter performance. From —30°F. to +150°F., superior J3 temperature compensation gives almost perfect straight line accuracy.

COMPARE disk speed, torque, watts loss, temperature compensation. To these features, add the superior magnetic moving system. That's the J3, first in performance values.

SANGAMO ELECTRIC COMPANY / SPRINGFIELD ILLINOIS

CALENDAR OF EVENTS

Aug. 16-18—APPA Accounting and Finance Workshop, Ambassador Hotel, Los Angeles, Calif.

Aug. 23-25 — AIEE Pacific General Meeting, Hotel Utah, Salt Lake City, Utah.

Aug. 28-29 — American Management Association Conference & Exhibit, Hotel Astor, New York, N. Y.

Sept. 5-8—Woodward Governor Prime Mover Control Conference, Rockford, Ill.

Sept. 6-8—AIEE-IRE-ISA Joint Nuclear Instrumentation Conference, North Carolina State College, Raleigh, N. C.

Sept. 10-13—Rocky Mountain Electric League Fall Convention, Jackson Lake Lodge, Moran, Wyo.

Sept. 11-15—16th Annual ISA Instrument-Automation Conference & Exhibit, Biltmore Hotel, Los Angeles, Calif.

Sept. 12-14—Eastern Wood Pole Conference, Syracuse University, Syracuse, N. Y.

Sept. 14-15 — AIEE-ASME Engineering Management Conference, Hotel Roosevelt, New York, N. Y.

Sept. 20-21—P.I.P. Workshop Conference, Brown Palace Hotel, Denver, Colo.

Sept. 20-22—NELPA Annual Business Meeting, Sheraton-Portland Hotel, Portland, Ore.

Sept. 20-22—Annual National Electric Farm Power Conference, Leamington Hotel, Minneapolis, Minn.

Sept. 21-22—MVEA Accounting Conference, Sheraton-Jefferson Hotel, St. Louis, Mo.

Sept. 24-27—AIEE-ASME National Power Conference, St. Francis Hotel, San Francisco, Calif.

Sept. 24-29—National Technical Conference, Hotel Chase-Park Plaza, St. Louis, Mo.

Sept. 25-27 — EEI Industrial Relations Roundtable Conference, Drake Hotel, Chicago, Ill.

Sept. 25-28—Industrial Building Exposition & Congress, New York Coliseum, New York, N. Y.

Sept. 27-29—MVEA Sales, Rural & Home Service Conference, President Hotel, Kansas City, Mo.

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What's More Important Than Price?—This is the question that was raised and answered by J. W. McNeil, manager of Chemical Procurement for the Pittsburgh Chemical Company, at a recent National Association of Purchasing Agents' meeting. His views are so pertinent to the situation now prevalent in our industry that it seems appropriate to cite them here.

Price is only one factor in a spectrum of factors that represent value to the buyer, Mr. McNeil reminds his purchasing colleagues. Some of the principal factors include (1) continuity of adequate supply, (2) reliability of supplier's personnel and organization, (3) quality of material, and (4) service.

Price, or no price, he declares, it is the buyer's responsibility to develop vendors, through evaluation techniques, who will contribute significantly to his company's business health, competitive position and growth potential.

Sound, analytical buying means cost reduction and procurement of maximum value for each dollar spent, he believes. On this basis, purchasing emerges as a management function which is expected to contribute profits to the company. By the same token, he points out, a sales group which merely "moves" a product on a price basis, rather than *markets* it, can only be classified as a service function. Instead, sales should also be a management function capable of generating satisfactory profits for the company.

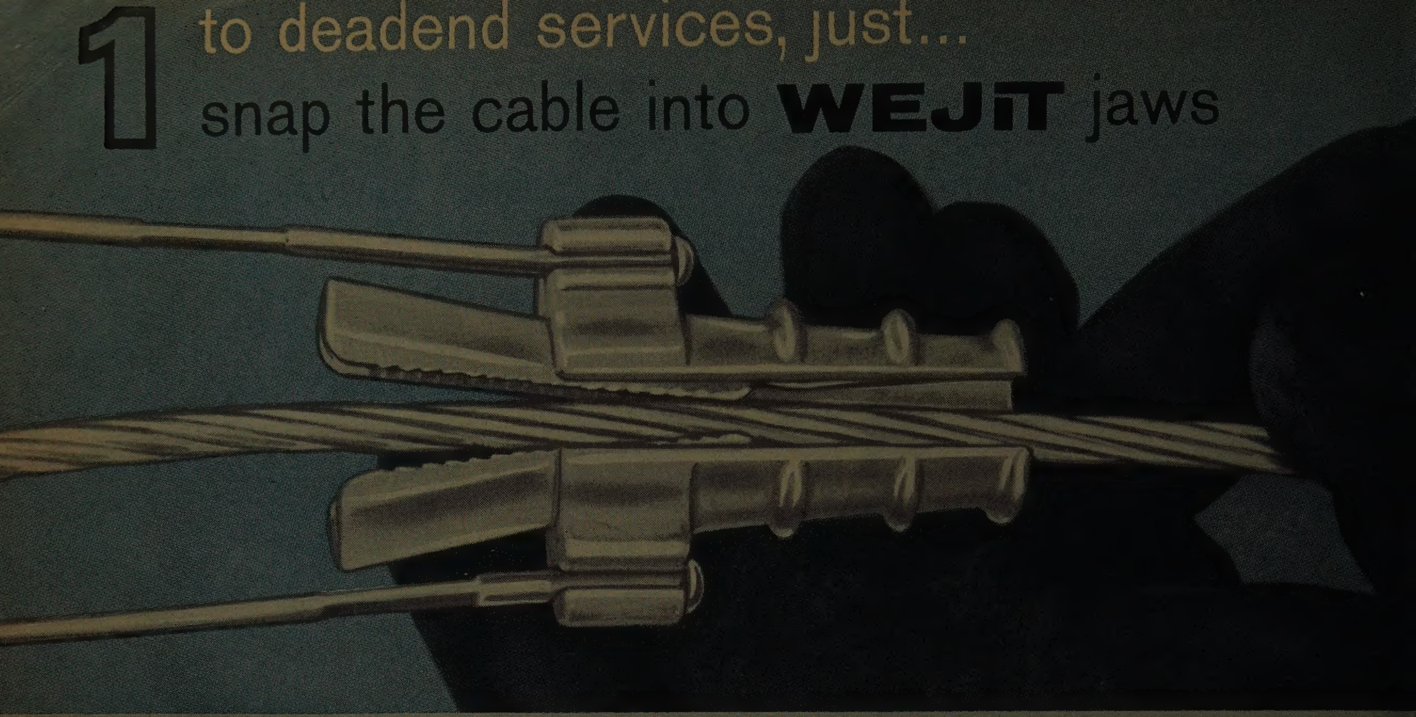
Mr. McNeil suggests it would seem helpful if a salesman would periodically make his own value analysis as it pertains to each product and buyer he is selling or desires to sell. Results could be relayed to the buyer. Such action would be aggressive and motivate or stimulate most buyers. In short, *a seller who has values to offer needs to stress value,* says Mr. McNeil.

Mr. McNeil's analysis closely parallels the views expressed in a new policy statement by Line Material Industries. This is contained in a small illustrated leaflet titled "Unseen Elements of Price."

Line Material sums up its analysis in these words: Unquestionably price is an extremely vital element to seller and purchaser. It must be reasonable and fair to both. It demands from the seller keen, honest judgment, and it asks of the buyer evaluation, understanding, and acceptance. The absence of these traits creates chaos; the presence of these traits creates a healthy vigorous industry.

These observations serve to re-emphasize a basic consideration that is perhaps more important to our industry than any other; namely, that quality is remembered long after price is forgotten.

P. B. Garrett
Publisher and Editor



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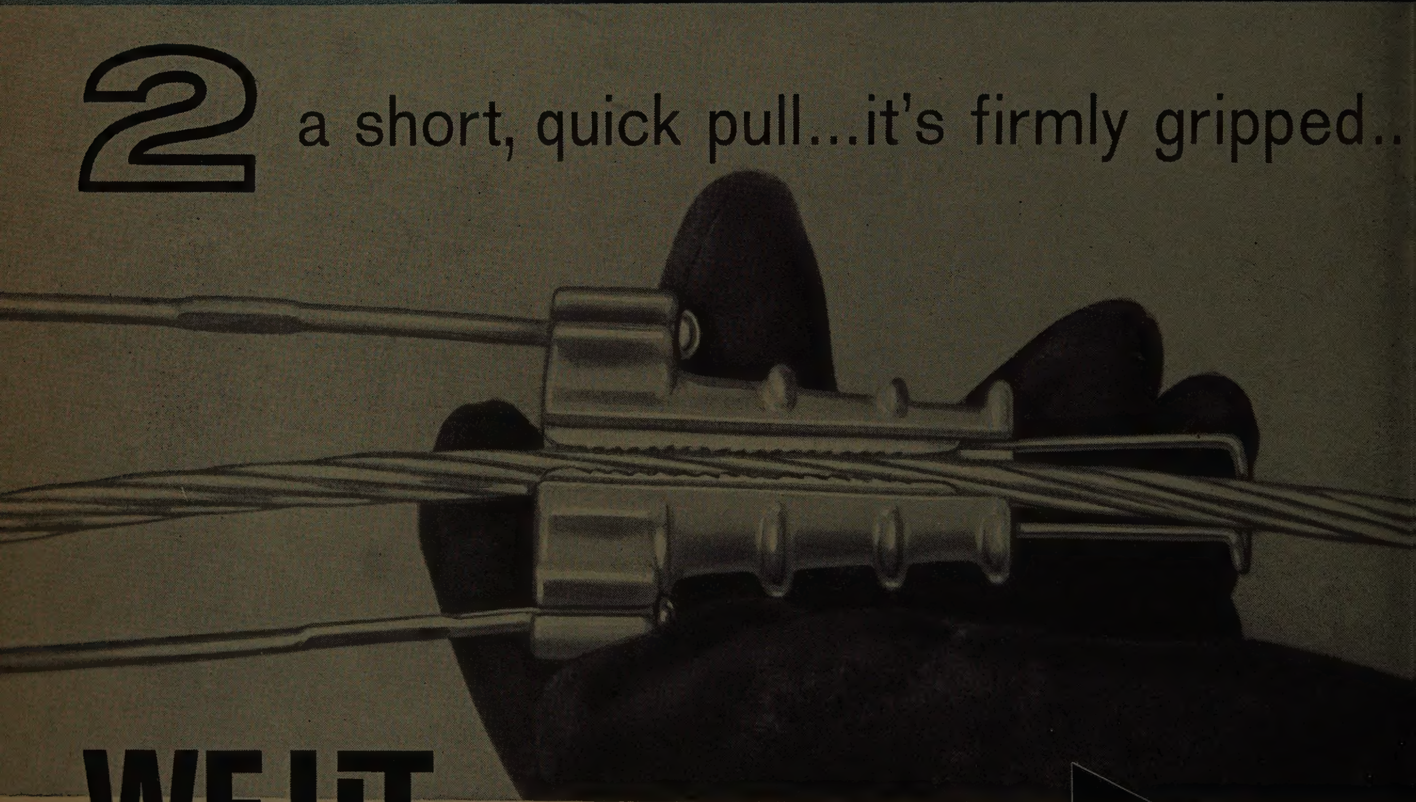

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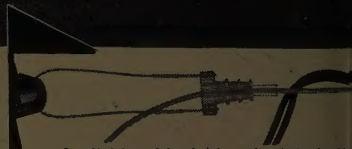

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